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How the Miner Fills in His Day.—Page 811

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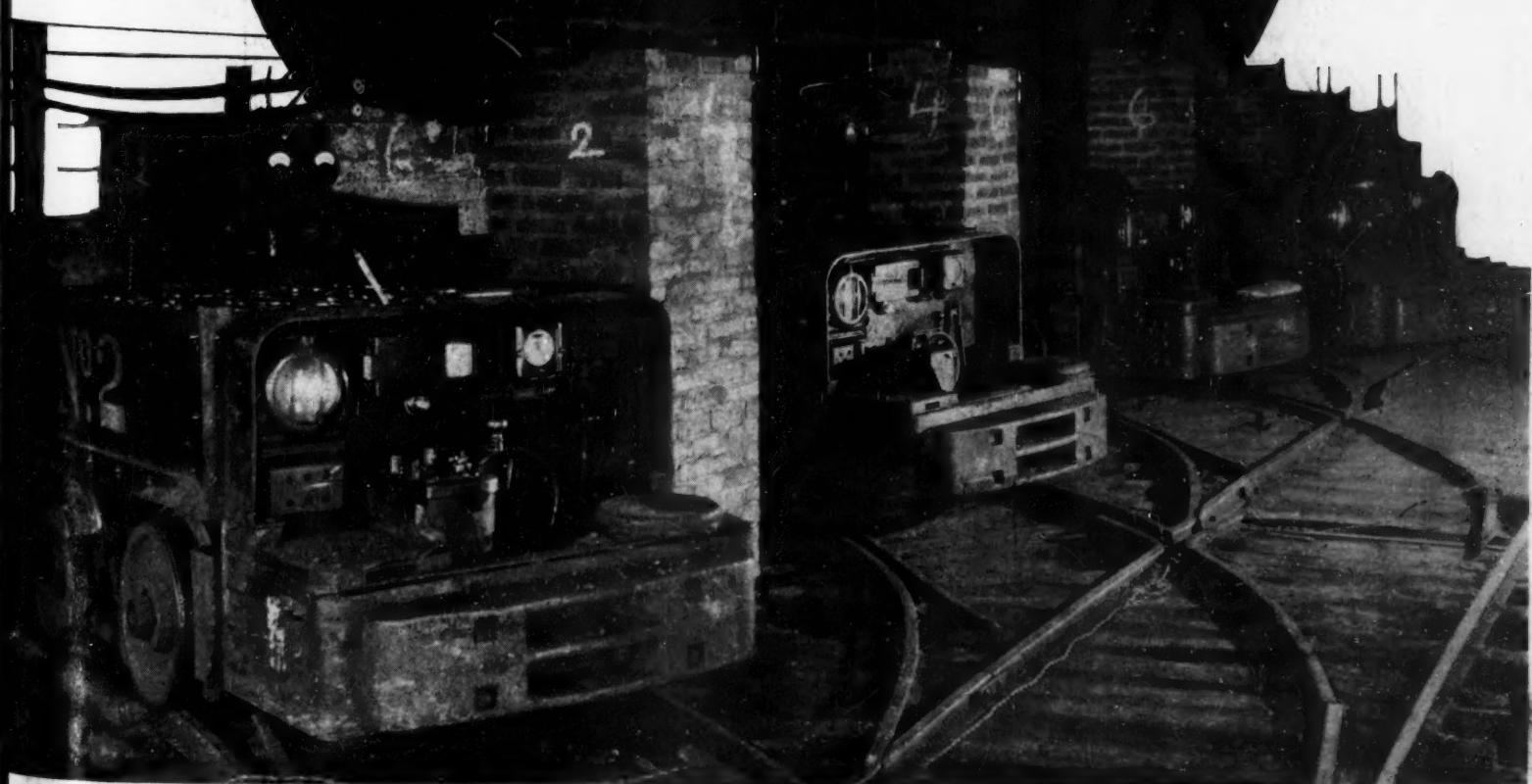
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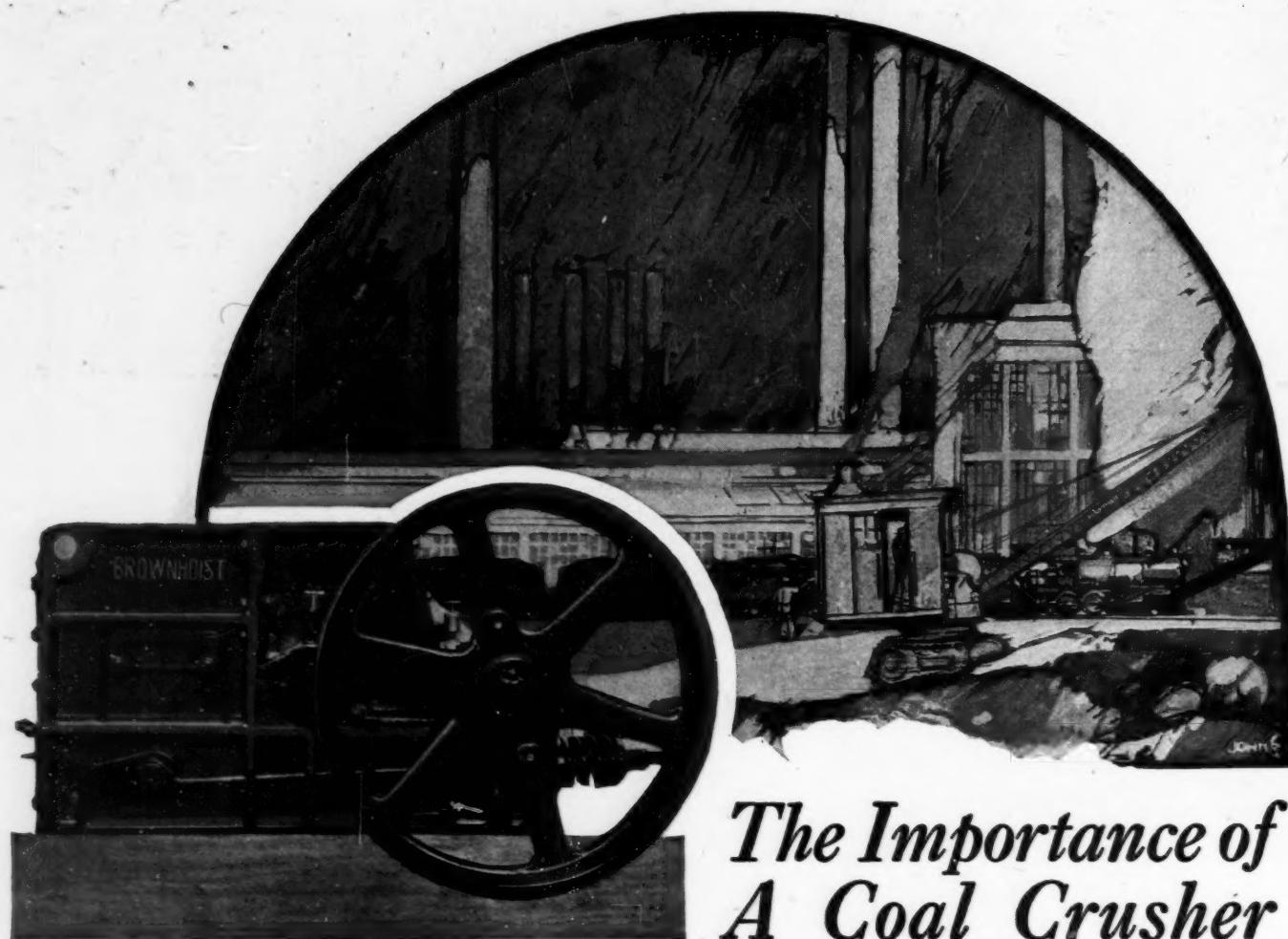
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MATERIAL HANDLING EQUIPMENT

COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, Editor

Volume 24

NEW YORK, NOVEMBER 29, 1923

Number 22

The Virginian Case

THE Interstate Commerce Commission is expected to reverse itself in the matter of the application of the Virginian Railway for authority to extend trackage to one of the new mines of the Pocahontas Fuel Co. Even those who want to see overdevelopment halted by denying trackage extensions will admit that the Commission could not have selected a more unfortunate instance in which to test the theory. In normal years the Virginian is able to supply practically all of the cars that can be utilized. The period in 1922 cited by the Commission during which the mines on that line had an inadequate car supply was abnormal because of the coal strike and shopmen's strike then in progress. The railroad company has been making an effort to meet the requirements of the mines on its line. More than \$13,000,000 will be expended on the electrification of 134 miles of its line, while more than \$3,000,000 is being expended in increasing its coal-handling facilities. These expenditures would not be justified were there to be uncertainty as to the rate at which coal-mining expansion would be allowed.

The whole question of throttling coal-mine development by denial of transportation is before the government now. The U. S. Coal Commission declared in one report that the distribution of coal "must be free and untrammeled," that there should be no discrimination, such as by assigned cars. The Transportation Act clearly places on the Interstate Commerce Commission the responsibility of holding railroad expansion within certain limits. What is in controversy here is not the authority but its application. That, it appears, is in a fair way of correction in this instance. The unsettling aspect, however, is the readiness, the unseemly haste, with which the Commerce Commission resorted to the exercise of this power in controlling the coal mines. Fired with the zeal of a crusader, eager to grapple with this giant of overdevelopment, the Commission assumed a position that it will be forced to abandon.

The Real Cloud

THE officers of the United Mine Workers would doubtless be happy indeed if they could today sign up a two-year renewal of the soft-coal contract that expires next April 1. Likewise the union operators, no matter how hard pressed they are now for orders to keep their mines running, would prefer such an arrangement, since the alternative is a strike. Now when both parties are of mind what is to prevent the happy consummation?

In the first place, John L. Lewis and his lieutenants must sell to the bituminous-coal workers the idea that two more years at the present scale is the best thing for them. He must sell it to men who have seen how easily the anthracite workers got their 10-per cent

increase in wages by playing into Pinchot's political campaign.

The soft-coal operators, being unorganized, are drifting into two camps: Those whose mines are idle or soon will be and who therefore would expect to profit by a prolonged strike, and those who, convinced that a wage reduction is out of the question next year, desire nothing more than to have uninterrupted operation. The large companies are all in this class. They can hold the others in line, barring outside interference.

The real cloud on the horizon is not a disagreement between union mine labor and operators; it is the warfare between the non-union operators and the union. To keep the union out of West Virginia the operators there have been aggressive in campaigns against the organization. They have led the fight against the check-off. Now the Lewis men fear that the hoped-for peace and tranquillity of their coming joint sessions will be disrupted by demands for abolition of the check-off. They are blaming the generation of this feeling on the non-union influence in the National Coal Association. Union operators also are saying that the persistent propaganda of the past year on "violence" has been driving a wedge between them and the organized workers.

One wonders then at the outburst of Frank Keeney, union organizer and local president, this week. Speaking as the captain of a loyal but decreasing band of union mine workers in West Virginia, he sounds his battle cry: The United Mine Workers has money and will assault the West Virginia stronghold this coming year. West Virginia operators always rally to such a challenge and the trouble starts anew. Mr. Lewis is the big boss; does he desire peace? Is this the way to promote harmony?

Selling Ford Coal

HENRY FORD is now a regular coal operator. He has a string of mines and is grappling with the production and marketing problems that beset the ordinary mortal who engages in this fascinating business. He has found that his mine capacity is greater than his immediate plant requirements and he is seeking to get rid of his surplus, for he, as have others, learns that part-time mine operation adds to cost.

Mr. Ford would eliminate fluctuations in coal prices and irregularities in production—for his friends and his mines. There are said to be around 300 concerns manufacturing parts for his car and he is taking a paternal interest in their coal supply. Not so long ago he sent to each of these 300 a questionnaire concerning their coal supply and their fuel requirements. If he can contract to furnish them all with coal as he in turn buys their products, he can make his coal-mining ventures successful and at the same time help these sundry manufacturers to have a steady fuel sup-

ply. As a coal operator Mr. Ford is animated by the same motives that govern every well-managed coal operation.

The difficulty he finds is that common to the trade—the coal consumers are not all far seeing, for some have indicated to him that his all-the-year-around price is much above what coal is now selling for on the spot market and that they are buying at the lowest price. He has the advantage, however, that falls to any consumer-operator of dictating, to some extent at least, to those who burn coal and sell to him. For instance, this fall one large concern that sells to the Ford plant a large part of its requirements in a certain line found, one morning, several hundred cars of coal at the gate. Mr. Ford had shipped them, invoice to follow. What had been a competitive market for the commercial operator became a forced outlet for surplus Ford coal.

As a coal producer, Henry Ford has yet to make his mark, but as a coal seller he has mastered the fundamentals.

Let the Railroads Pay the Bill

ONE of the principal duties of a chief executive in this nation of ours is to satisfy the voters—the most numerous class of voters, of course. In politics we are no longer concerned with minorities. In this country we should do as was customary at the hustings in England years ago. Dickens records Mr. Pickwick as going to a political gathering and advising his little band of followers, "Shout with the mob." Mr. Snodgrass replied, "But where there are two mobs?" Whereupon Mr. Pickwick said, "Shout with the largest." Our chief executive follows the advice of Mr. Pickwick. He also shouts with the crowd, for the voice of the President always is heard whether raised or lowered.

On Oct. 16 the President urged the chief executive of the Pennsylvania Railroad, Mr. Rea, and through him sought to influence the presidents of the coal-carrying railroads, to lower the freight rates on anthracite, not so much because domestic-coal rates are too high but because they are higher than export rates to Canada. It is hardly necessary to say that if domestic freights are too high they should be lowered and that it is an excusable point of view to hold that our own citizens should not have to pay a higher freight rate than Canadians. All this is obvious.

But at the same conference, and as it were in the same breath, the President asked the railroads to let American wheat be delivered to foreigners at a lower rate than to citizens of the United States. How is it that it is all wrong to let foreigners have a lower freight rate when coal is concerned and all right when wheat is to be shipped?

Let us suppose the railroads concede a lower rate on wheat to foreigners. What is to protect the roads when the consumer discovers that he is paying a higher rate? Will he not argue with wheat as the President is now arguing with coal, that the domestic freight rate should be the same as the export, and leave the railroads with a lower rate on wheat all around?

The railroad executives have made dignified and sufficient answer. They have advised the President that they cannot offhand concede the lower rates on grain, and that furthermore they doubt the efficacy of such a remedy, inasmuch as foreign farmers would meet their cut. The matter is to be investigated by the Interstate Commerce Commission. As to anthracite the answer

is obvious; the Coal Commission asked, and the Commerce Commission has initiated an investigation covering these rates. It is now in progress. We do not know what will happen to the grain rates but we are willing to venture the surmise that as to hard coal the final decision will parallel that of 1915. Some, possibly many, individual rates will be adjusted, but the *rate level* will be undisturbed.

The railroads are not yet in position to reduce freight rates generally, though they are making progress in that direction. That the Interstate Commerce Commission has just refused to open its grain case to all basic commodities is evidence of the situation.

But the President is right; it is good diplomacy to side with the larger number of voters—with the consumer as to coal, with the farmer as to wheat.

The Four-a-week Mind May Change

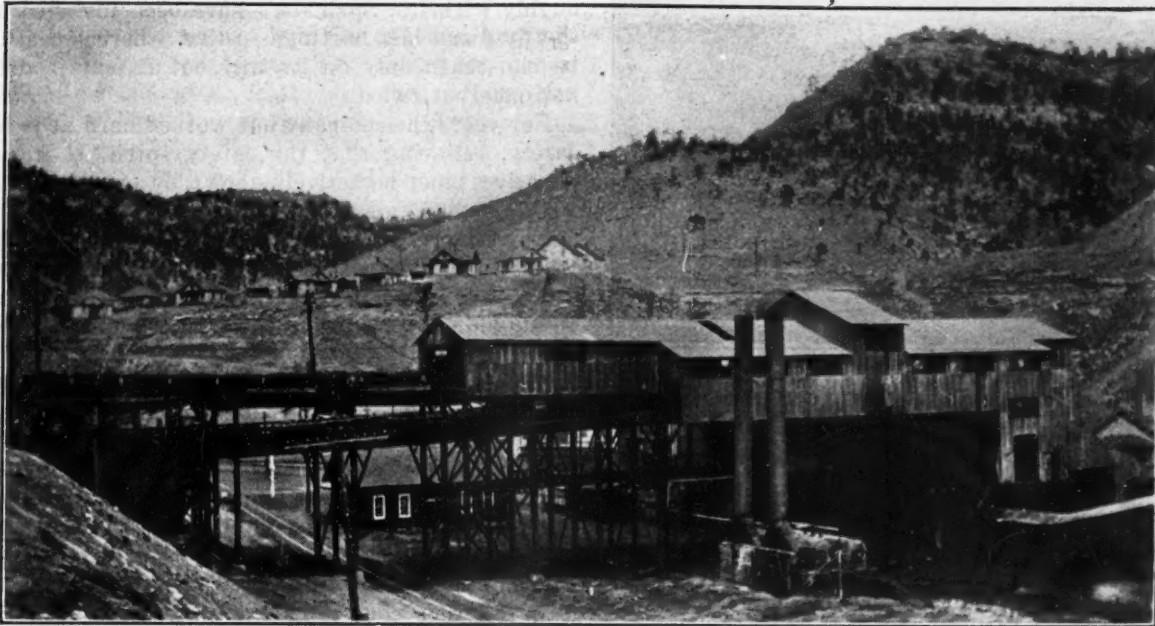
THERE is constant proof that coal miners' wages need no increase provided there are few enough mines and miners to justify regular operation. Only last month two loaders in an Indiana mine drew \$500 apiece. And in one particularly propitious day this pair loaded out 38 tons per man. In another mine in that state it is not uncommon for loaders to make more than \$400 a month.

This sort of thing occurs in these days of flat markets only in mines fortunately situated as to disposition of output. In most union regions such performance of miners is known to be invariably broken by layoffs and petty strikes, as at the Brewerton Coal Co. mine at Lincoln, Ill. There, because of an excellent railroad contract for engine fuel, the mine operated continuously all summer while many neighboring operations were lucky to get two days a week. Four months of this produced the inevitable result—the men, yearning for a vacation, struck because the check weighman objected one morning to a new housing around the beam of an automatic recording scale. It is an old, old story to union field operators. When a mine exceeds four days a week regularly—look out.

Harassing to mine owners though this four-days-a-week psychology of miners may be at times, it at least has the virtue of hastening the day of complete machine mining and loading. When that day arrives the \$500 a month that is excessive pay to an underground laborer now will be a good payroll investment if it goes to a machine operator who gets maximum service out of his machine. Loader operation should naturally gravitate into the hands of men of an intelligence superior to the four-a-week mental process. It is thus easy to be optimistic for the future even in the face of present discouragement.

THAT BRIGHT SCHEME for pumping screenings direct from the tipples 15 miles into St. Louis would be fine for Standard district producers except for one trifling obstacle: They have freight ills and coal mines and power and pipe lines, but yes, they have no water.

ORIGINAL CENSUS RETURNS analyzed by the Coal Commission showed coal-mine operatives in every state Jan. 1, 1920. Florida had 24, but no coal mines, so they must have been at Palm Beach. But how did New York register 299 coal miners, unless they were Greenwich Village miners?



Tipple of Mines Nos. 1 and 2, Phelps Dodge Corporation at Dawson, N. M.

Run Mines on Batteries? Every Wire May Be Removed At Dawson to Prevent Explosions

Phelps Dodge Corporation Tries Out Big 80-Cell Units for Haulage and Cutting—Adobe Dust, Water and Education Do Their Parts in Redoubled Safety Campaign at Stag Canyon Operations

WHEN a single electric arc in a coal mine kills 122 miners in one fatal burst of unbridled energy it is time to eliminate arcs, even at the cost of heroic methods. The Phelps Dodge Corporation, which operates six mines at Dawson, in the Stag Canyon region of New Mexico, is hunting for such methods. For one thing it has practically decided to remove every wire from every mine. This means operating the mines on storage batteries from slope mouths to room faces, with consequent engineering problems galore. But possibly it can be done. The company proposes to find out.

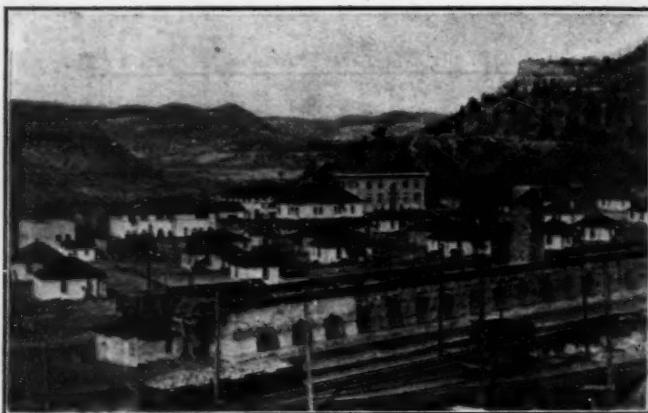
Also, it is applying every other method it can devise or discover to increase the factor of safety in its mines, even though they already have been provided for years with safeguards of the most rigorous kind. The precautions it had taken did not serve to prevent the explosion of Feb. 8, 1923, which killed the 122 men. A runaway load on the main slope knocked down haulageway timbers. This dropped a feeder power line onto the steel car, forming an arc which ignited coal dust. The aftershock of the explosion was felt almost as keenly by the company as by the bereft relatives. So "Safety—whatever the cost" is now the company's motto.

Eliminating wires from the Stag Canyon mines means putting all haulage and cutting on storage batteries. If mechanical loaders are installed, they too, of course, must operate on batteries. Storage-battery locomotives already have been used for some of the

gathering in the mines of the Stag Canyon group. The first move now is to install battery locomotives on main haulageways. This experiment is to be made first in No. 6 mine, where there is a 6,000-ft. main haul. Later it is to be introduced into the other mines, until the system is perfected for the whole group.

The preliminary order is for two 15-ton locomotives to be run singly or in tandem. The standard battery unit will be of 80 cells mounted on a four-wheel truck. When operated in tandem, two of these will constitute a locomotive 16 ft. 6 in. long, 57 in. high and 68 in. wide, which are approximately the dimensions of the heavy locomotives now being used for main haulage. The charge in each unit will be freshened each time the locomotive reaches the outside, which on an average will be once every hour. Complete charging can be done at nights.

To operate cutting machines, standard battery units can be assembled close to each machine in whatever numbers are necessary, though it is possible that one will serve each cutter. Most cutters now require about 50 hp. for efficient operation. As the battery units are large and as it is proposed to discharge them at nine times and to charge them at six times their rating, it is hoped that the standard units will deliver enough power to run the underground machinery successfully and that the time consumed in charging and moving batteries will not seriously reduce their efficiency. The life of batteries under such strenuous usage remains to be proved—a reason for proceeding with caution.



GENERAL OFFICES, HOSPITAL AND DISPENSARY

W. D. Brennan, the general manager, has much confidence in storage batteries and has already done some pioneering with them for coal-mine use. He thinks it is possible for a mine to operate its underground works entirely on batteries and to charge at night when the load at a central station is light, buying electricity for night charging accordingly at a most favorable rate and being enabled to reduce by 75 per cent the capacity of its own power plant. In consequence the generally prophesied increase in power costs by the use of batteries may be largely counterbalanced at the Dawson mines by economies, not only in the plant but in transmission, mine accidents being reduced at the same time.

Other steps have already been taken in the Phelps Dodge mines to raise the safety factor. Adobe-dust barriers of the trough type have been installed at intervals in main and side entries. Also the practice of spreading adobe on floors along particularly dusty 1,000-ft. stretches of haulageway has been adopted. Non-inflammable dirt of this character can be obtained at the surface for the cost and trouble of loading it into cars, running it into the mine and distributing it.

The roadway to be treated is first cleaned of loose coal. Then about 3 in. of adobe ranging from coarse to 100-mesh is shoveled over the exposed surface. Once a month men with rakes go over it, working the inflammable coal dust safely down into it. Eventually the percentage of coal in the floor dust becomes so high that it is thought well to clean the roadway of the mingled coal and adobe, and another layer of the non-inflammable dust is spread. This is considered good protection against dust explosions in mines such as these, where dust is a real and constant menace.

Water always has been liberally used in the Dawson mines. It is piped to every room and used to wash

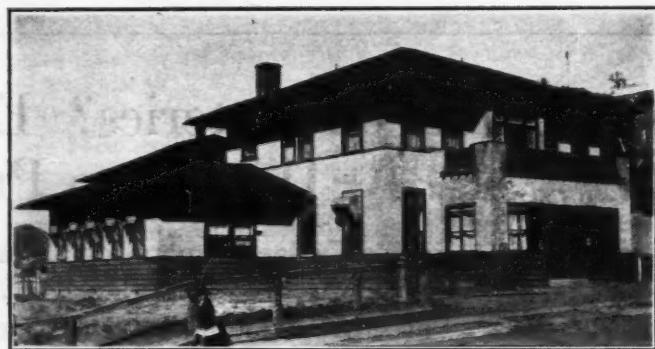


PHELPS DODGE CORPORATION'S STORE AND HOTEL

down entries. But since the explosion additional use is made of water. All outgoing coal is wetted thoroughly with it. Sprinklers have been installed at both the first and last partings so that whereas coal used to be moistened only on its way out it now is drenched, not once but twice.

For years the company has worked hard at promoting safety, believing that the safety spirit, if it is to be effective, must be actively shown by everyone from the highest official all the way down to the least important employee. W. F. Murray, safety engineer for the company, told the Rocky Mountain Coal Mining Institute something about the safety work at the Dawson mines in an address at a recent meeting. A part of his paper follows:

"Under the system in operation at the Dawson mines a safety engineer is provided to insist on compliance with the rules established to promote safety and to see that all safety equipment is kept in efficient working order. At least once a month the safety engineer, in company with a safety committee consisting of a miner, a company man and the mine foreman, makes an inspection of the working parts of all the mines to ascertain whether conditions are such as to assure safety



HOSPITAL OF PHELPS DODGE CORPORATION

He makes a formal report as to his findings to the manager.

"As is usually the case, men on these safety committees after having gone through the mines to examine other men's places are careful to keep their own working places in such good condition that the men following them will not find that they themselves have neglected to make their places safe.

"It is indispensable that the mine foreman believe in the value of these committees and that he realize that the committee is not there to criticize his work but rather for the purpose of assisting him in presenting to the uninstructed or careless workman by practical suggestions the manner in which the greatest degree of safety can be attained.

"As is the case in this day and age, the majority of workmen in the mines are composed of those whose education has been neglected and whose experience in the mines is limited, and in a great many cases accidents which have occurred to these men may be traced to the fact that they were not fully instructed as to the proper method of performing certain of their duties or that the instructions were not understood. It is to this class of workmen that the safety committees pay special attention. The proper methods of erecting timbers, placing cap pieces, drilling shotholes, spragging coal, blocking cars, etc., are explained. As the majority of people are susceptible to criticism, much efficient

work can be accomplished if care is taken to show the workman that his work is not being criticized for any other purpose than to reduce his liability to injury.

"At the Dawson mines, for the information and guidance of the new employee, the company gives him a set of published rules, printed in the various languages used by the several nationalities employed at the mines. These describe the safety rules in effect at that operation. They not only cover the duties which the miner must observe under given conditions but they describe also the special duties of the mine foreman, fireboss, shotfirer, timberman, trackman, drivers, motorman, nippers, fan attendants, and tipplemen. Each man entering employment for the first time also is given a copy of the state mining laws.

"Free picture shows, at which are displayed the safety films furnished by the Bureau of Mines, are employed to portray through the effective medium of the eye those safety truths that might otherwise never reach the heedless or illiterate miner. Throughout the mines safety signs and slogans are posted in conspicuous places to recall to the miner his constant exposure to danger and to keep him alert to its presence.

"Somewhat of an innovation has been made in teaching the lessons of safety by introducing them into an annual Community Night program. Community night is an evening set apart for the social enjoyment of the miner and his family. The program for last year was presented in the form of a vaudeville show, the five members of the safety department who took part in an act being starred as the 'Black Diamond Quintet.'

"In this act, a rescue team with complete equipment entered the darkened stage and demonstrated the rescue of a miner overcome with gas. Immediately following this demonstration a short talk was made relative to the use of the apparatus, its method of operation, and other points of interest. In this manner the interest of the miners' wives and families in the safety movement was aroused.

"Posted in a conspicuous place under glass cover at each check cabin of the mines is a large blueprint showing a graphic representation of nine 'thermometers,' representing the nine Dawson mines, upon which are designated by means of a graduated scale the number of serious accidents occurring at each mine during each month of the year. Beginning with the month of January, the red line which simulates mercury climbs one degree for each serious accident. At the end of the year the total record for each mine for the twelve months is graphically shown, month by month.

"For the purpose of registration and comparison, a serious accident is considered to be one which prevents resumption of work in less than 14 days. Fatal



FEDERAL VOCATIONAL COURSES—MECHANICAL DRAWING

accidents are included in this class. The period of disablement starts the moment the accident occurs and ceases the moment the workman is released by the doctor for return to work.

"The story told by the thermometers is visual and readily understood, provoking at least some reflection on the part of the miner who studies it. Twice daily as the miner calls for and returns his check, that constant reminder stares him in the face and draws to his attention the fact that the price of his safety is constant vigilance.

"Undoubtedly, the greatest value of this device as an incentive to safety is the opportunity it affords the miner and mine foreman for making a ready comparison between the number of accidents happening in his own mine and those occurring in the other eight. It stimulates in them both, an instant and natural desire that the mine in which they work shall have the reputation of recording the smallest number of accidents.

"Believing education to be an important asset to the welfare of a mining community, classes in mining science have been conducted under the supervision of the Federal Board for Vocational Education. These were started in September, 1919. Classes were also organized in mechanical, architectural and electrical drawing.

"In conformity with the vocational-board ruling, classes in mining are limited to underground men. These restrictions do not apply to the drawing classes. Anyone working in and around the mines is eligible to receive instruction in this training.

"As the instruction is free, men from all classes and drawn from all countries are enrolled. During the past year the nationalities represented were: American, Scotch, Welsh, Mexican, Italian, and Slavish and consisted of miners, drivers, motormen, nippers, track-



CLASS IN COAL MINING IN PUBLIC SCHOOL



WHERE MEN ARE TRAINED IN RESCUE WORK

layers, shotfirers and firebosses. Classes are held in the afternoon for the men working at night and in the evening for the men on the day shift. The ages of those enrolled range from twenty to forty-two years.

"The subjects taught consist of the following: Mining arithmetic, mine gases, mine ventilation, safety lamps, timbering, and shotfiring. Safety ideas are incorporated in the teaching of the various subjects, and the state mining laws are discussed.

"These classes are held for a term of nine months, at the end of which examinations to determine the students' proficiency are held, and the successful candidates are given a certificate issued by the state board for vocational education. During the past term fifty-three men were enrolled in these classes.

"The work of instruction is encouraged by the management in every way, the training station and its conveniences being freely offered for its use, books and periodicals being supplied and opportunities offered for practical demonstration.

"Realizing that the workman born in a foreign country, in order to become more efficient in his work and follow the ordinary rules of safety, as well as become a good American citizen, must know and understand the English language, the Phelps Dodge Corporation has for the past three years conducted night schools in all four of the Dawson school buildings. From a safety point of view the work is helpful, because the men learn to read well enough to understand the different safety and danger signs. They acquire enough English in a short time to enable them to understand and appreciate lectures on first-aid and safety precautions.

"A well-equipped training station, unique in some of its features, has been built and maintained solely for the use of the safety department. This two-story cement-block building was completed in 1910 and accommodates on its second floor a commodious first-aid and class room, the safety engineer's office and a reading room. The lower floor contains a storeroom, apparatus room, furnace and training gallery. Leading from the back of the training station into the side of the mountain, against which the training station is built, a training gallery has been driven. This gallery duplicates in construction a double entry underground and contains the features found in an ordinary mine.

"Classes in the use and care of oxygen breathing apparatus are conducted twice a week. One class meets during the day for the benefit of those working at night and another class meets in the evening for those who work during the day.

"The candidate for mine-rescue work must undergo



SMOKE CHAMBER, TRAINING STATION

a thorough physical examination. Before he is permitted to wear a machine he must familiarize himself with the apparatus, be able to designate the different parts, assemble them and test the machine. He is then required to wear the apparatus in normal air for a time, after which he is ready to enter the train-

ing gallery, with its formaldehyde fumes. Here he is compelled to crawl over and under imposed obstructions, arranged as in a wrecked mine, and to work with various tools, setting timbers, etc. In this training, emphasis is placed on work such as would have to be done during a mine fire or explosion.

"After completing fifty hours' training with the use of the apparatus and having completed a satisfactory examination, the student is then considered thoroughly adjusted to the use of the apparatus and is given a certificate from the company, indicating that he is a trained man qualified to use and care for mine-rescue equipment."

Washery Water Improves Farm Lands

THREATENED with a suit by farmers and others for having destroyed the quality of the land, the Galloway Coal Co., of Holly Grove, Ala., induced the Department of Agronomy of the Alabama Agricultural Experiment Station at Auburn, Ala., to test the effect of the mine and washer water on the soil thus alleged to have been destroyed.

This was done by growing corn and velvet beans in it and supplying them with distilled water, water from the Auburn mains, water from the "contaminated" Lost Creek and from the Galloway washer. Five samples each of 300 lb. of soil from five different farms were used and several gallons of the different kinds of water. A fifth test was made by adding acid phosphate as a fertilizer to the various waters. Better growth was obtained with the creek and coal-washer water than with the distilled and Auburn water, and still better success with water containing acid phosphate.

The department offers to make a test next spring on a farm along Lost Creek to show that if the soil is fed with fertilizer supplied by the department much can be done with it and that the coal-washer water will aid in the stimulation of the ground. The conclusions of the Auburn Experimental Station were: That water from Lost Creek or from the coal washer at Mine No. 15 of the Galloway Coal Co. is not toxic to corn in sand or water cultures, nor to velvet beans in water cultures; that neither contains anything that would injure the growth of corn on lands flooded by Lost Creek and that these waters contain a small quantity of plant food in solution but not enough to be of benefit to the growth of corn in land thus flooded.



RESCUE MEN READY FOR UNDERGROUND TRAINING

Illumination by Light Projectors at Coal Mines

Need for Greater Application of Advanced Principles
in Correct Illumination—Hazards of Poor Lighting—
Function of the Reflector—Focusing the Headlight

BY EDGAR GEALY

Electrical Engineer; Associate Editor, *Coal Age*

BECAUSE of the very nature, location and processes through which its product must pass before being placed on the market a coal mine always suggests a black, dark place. Therefore it is natural to conclude that the coal mine is a field where the theory and ideas of illumination and light projection have been carefully applied. However, this is not the case; in fact, generally speaking, the coal field is a region not so well illuminated as one would expect.

Much has been done of late in the way of proper illumination in stores, factories and homes. It has been conclusively proved that improper illumination produces eyestrain, fatigue, cuts down production and increases accidents.

Then again, large savings in lamp costs, labor charges and power consumption are possible by the use of proper reflectors. In many mines and around mine properties it is an uncommon sight to see large candle-power lamps hanging without reflectors. In hoist rooms much can be done to decrease the liability of accident by the use of angle-type reflectors.

Perhaps the most necessary place for proper illumination is at the foot of the shaft or at a caging level. Here it is highly desirable to have efficient lighting units because it is the heart of the transportation system and delay here due to loss of light, insufficient light, or accident cuts down the output. For these reasons lights should be carefully located and provided with reflectors to direct the light not onto the top of the car, where it is useless, but between the double tracks, where used, and on the sides where the wheels can be seen so that the cars may be properly handled and controlled.

In the main haulage roads, gangways and entries lights should have reflectors so as to properly illuminate the roads and track and not the roof, where most of the light usually is wasted.

Light projection by means of reflectors also finds its place on the outside property of the mines for protection purposes and inside the mines on the locomotives of the haulage system. It is this phase of illumination which most interests us at this time.

Much of the efficiency of a light source is frequently lost because of a lack of understanding of the proper focusing of lights. This is not only true of mine locomotive headlights but also of automobile headlights and light projectors used for property protection and other special purposes. The result is that lamps of much larger size than is necessary are used for certain desired effects.

Light projection, as the term is commonly employed, covers the redirection of light flux emanating from an artificial source by means of suitable optical systems so that it may be utilized within solid angles which are small as compared with those encountered in equipment for general illumination purposes.

Two general classes of apparatus are used to direct the flux from a source into the desired small angle: Opaque reflector systems controlling the light by the principle of specular reflection, and lens systems depending upon the refractive properties of glass. It is the first of these classes which is involved in headlight reflection.

All light sources may logically be broadly classed under three heads: Point sources, line sources, and large sources, i.e., sources having length and breadth, or length, breadth and thickness.

Polished metal and mirrored surfaces reflect light rays in such a way that the angle of incidence is equal to the angle of reflection. The shape of a parabolic reflecting surface is such that all light rays which are parallel to the principal axis and which strike the surface are reflected to a common point on the principal axis, called a focus. If a point light source is located

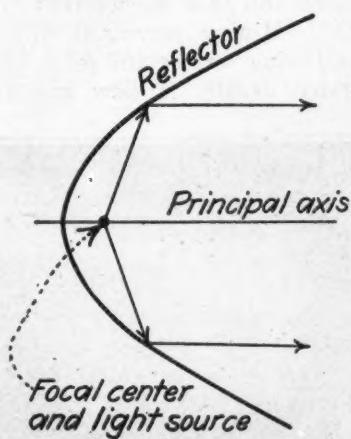


FIG. 1—LIGHT SOURCE AT FOCAL CENTER

The light rays are parallel to the principal axis and produce a long, narrow beam.

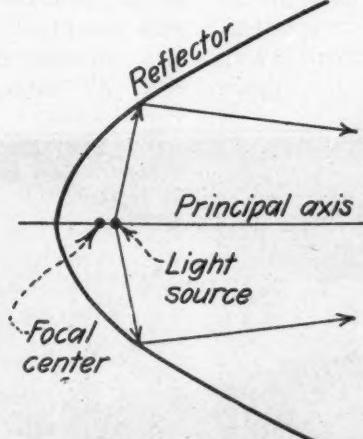


FIG. 2—LIGHT SOURCE AHEAD OF FOCAL CENTER

The light rays converge to the principal axis, then diverge and produce a broad cone of light.

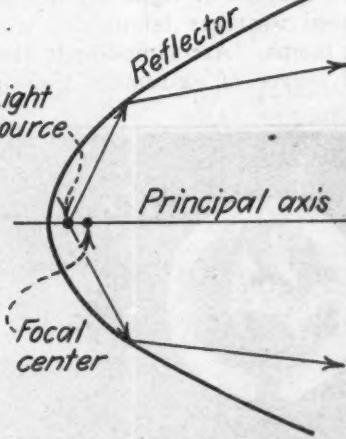
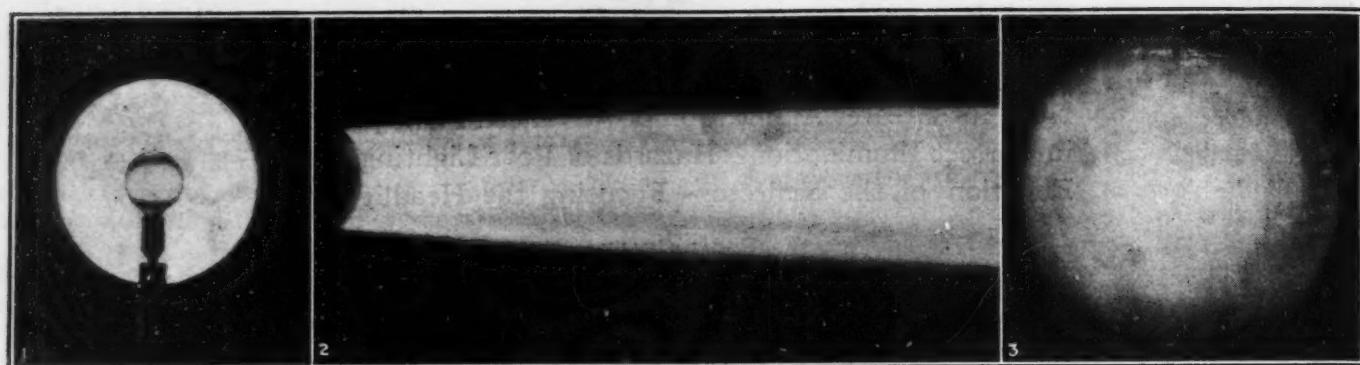


FIG. 3—LIGHT SOURCE BEHIND FOCAL CENTER

The rays diverge and produce a broad cone with a dark spot around the principal axis.



Courtesy Crouse-Hinds Co.

FIG. 4—LIGHT SOURCE AT FOCAL CENTER

The reflector is completely illuminated, the beam is intense and narrow, the light spot is uniform.

at the focus of a parabolic reflector, the converse holds true—that is, all the rays from the focus which strike the surface are reflected forward, parallel to the principal axis in a uniform beam.

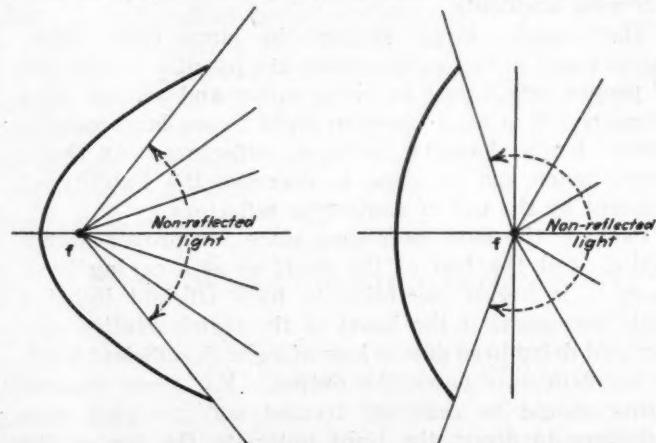
The effects produced by a point light source in these positions along the principal axis of a parabolic reflector are shown in Figs. 1, 2 and 3. It will be seen in Fig. 1 that the source at the focal center results in a parallel beam, and the source in front of the focal point, Fig. 2, causes the light rays to converge, cross and later diverge; Fig. 3 shows that the source between the surface and the focal center results in a divergent beam. A line source lying in the principal axis and extending behind and in front of the focal point would produce these three conditions together, with the result that a very irregular light distribution would result.

It should be borne in mind, of course, that no matter where the source is located, the light emitted within the solid angle determined by the rim of the reflector and the source does not strike the reflecting surface at all and is therefore distributed as a broad cone, useful for illuminating nearby objects outside the path of the beam, but contributing only very slightly to the intensity of the beam itself. Referring to Figs. 5 and 6 it will be seen that of two reflectors of the same diameter, the one with the shorter focal length will reflect the greater volume of light.

From the foregoing it is apparent that a light source for projection work in general should be of small dimension. Other features to be considered are high intensity, convenience, interchangeability, dependability, steadiness of the light, economy, and safety.

Two sources of light for projection purposes are in extended use: arc lamps and mazda concentrated-filament lamps. Arc lamps emit their light from a very small source of extremely high intensity. Direct-cur-

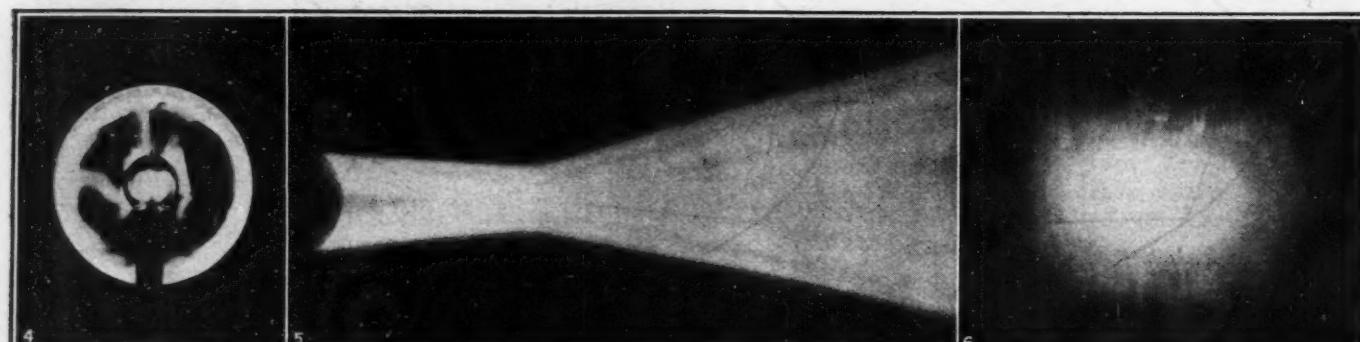
rent arcs are more efficient than alternating-current arcs because most of their light is emitted from the permanent crater which is formed in the end of the positive carbon, and a considerable part of the light from the crater may be directly utilized. Arc lights usually are supplied with a resistance or reactance to give stability of operation. Mazda lamps admirably meet the requirements of projection sources and because



FIGS. 5 AND 6—PROPORTION OF REFLECTED LIGHT
These two reflectors are of the same diameter yet the one on the left reflects a greater proportion of the light because it has a shorter focal center.

of their simplicity, convenience, and the fact that they may be obtained with filaments either condensed or well spread out, they are particularly adapted for projectors such as locomotive headlights, spotlights, etc.

In mining service nearly all types of equipment must withstand severe conditions and this is especially true with headlight equipment. Mining service is divided into two main classes, gathering service and main haulage. As gathering service usually is slow and fre-



Courtesy Crouse-Hinds Co.

FIG. 7—LIGHT SOURCE AHEAD OF FOCAL CENTER

The reflector is dark behind the rim, the beam is broad and the light spot is irregular.

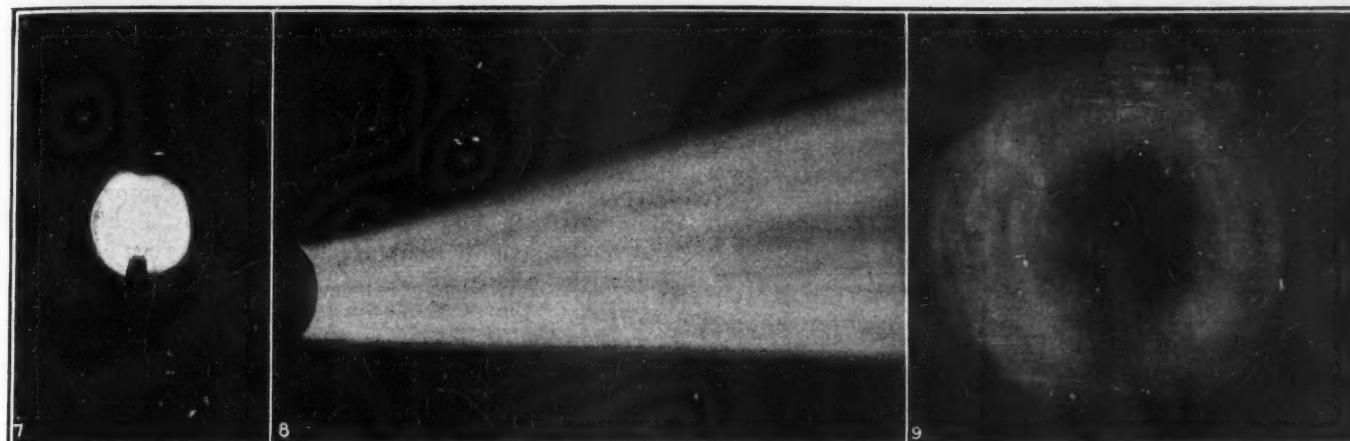


FIG. 8—LIGHT SOURCE BEHIND FOCAL CENTER
The reflector is dark at the rim, the beam is broad and the light spot is dark at the center.

Courtesy Crouse-Hinds Co.

quently on very irregular and curved track, too strong a light is objectionable on account of its dazzling the eye. A long projected light beam is seldom required either, yet there should be sufficient light cast over a broad area for coupling and switching. Main haulage service is at greater speed and usually on straight road, therefore the light beam should be long and more intense so as to sufficiently illuminate the haulageway well in advance of the locomotive.

Where the trolley voltage varies over wide ranges the arc headlight will be found to operate much better than incandescent lamps, which as a class are very susceptible to fluctuations of voltage. Under-voltage materially reduces the illumination while over-voltage generally reduces the life of incandescent lamps.

The selection of a headlight lamp for mining incandescent headlights is therefore one requiring much consideration if the best results in illumination, efficiency, and economy are to be realized. From the very nature

of the work of the gathering locomotive regular filament lamps may be used with success because the light source is not concentrated and the result is that a broader cone of light is obtained. On main haulage motors it is desirable to use a concentrated filament or focus type lamp.

An important consideration in connection with the selection of any incandescent lamp is that the lower voltage lamps give best results. High-voltage lamps are not nearly as reliable nor as efficient as 110 to 125-volt lamps, because the filaments of the higher voltage lamps are made of a longer, finer wire than the lower voltage lamps and therefore cannot be wound in as small a space. Lamps of low voltage are wound with a short, heavy wire, which can be concentrated in a smaller space and which will withstand vibration better than the higher voltage lamps. As a matter of economy it is desirable to adopt a lamp of low yet popular voltage. For this reason some com-



FIG. 11
Main-Haulage
Road
Illumination

Obstructions and switch locations must be spotted well in advance of a fast moving main-haulage locomotive. For these reasons the headlight beam should be narrow and more intense than on the gathering locomotive.

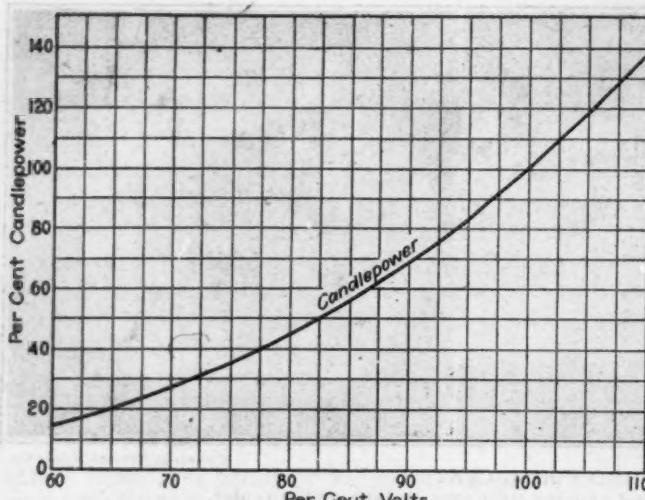


FIG. 9—CURVE SHOWING LOSS OF CANDLE-POWER WITH DECREASE OF APPLIED VOLTAGE

A 10-per cent drop in voltage results in 15-per cent drop in candlepower. A 20-per cent drop in voltage cuts the candlepower to less than half normal. To get a certain quantity of light where overrated lamps are supplied the user, he is forced to adopt larger lamps. This is very uneconomic owing to the extra cost of the lamp which is larger than would be necessary if it were of the proper voltage.

panies have adopted the mill type 115-volt lamp which is also used in buildings having considerable vibration and also for extension lights. This selection minimizes the numbers of different types required for stock.

The most important consideration in the effectiveness of a headlight or other type of projector beam is to have the light source located at the focal point of the reflector. Incandescent lamps are likely to vary in the length of their light centers, and for perfect adjustment it is necessary that the receptacle be adjustable so that the filament may be located at the focal point of the parabolic reflector.

To properly focus a headlight it should be located in a place as free as possible from other illumination and

then adjusted until the best light beam is obtained. Another method is to throw the beam of light on a wall and move the lamp within the reflector until the smallest illuminated spot is obtained. A little practice will enable one to focus the lamp quickly and accurately.

Fig. 4 shows the conditions which result when the lamp is in proper focus—1 shows the reflector evenly illuminated; 2 shows the resulting narrow light beam, and 3, the spot of light produced on a screen. Fig. 7 shows the conditions resulting when the light source is ahead of the focal center. Here 4 shows the rim of the reflector illuminated, resulting in the divergent then convergent beam, 5; and the result obtained on the screen is shown at 6.

When the light source is behind the focal center the results are as shown in Fig. 8. The reflector appears as shown in 7, the beam is divergent as shown in 8, and the result on the screen has a dark region as shown in 9.

From these photographs it becomes obvious just what adjustment should be made to a headlight to put the light center in proper focus. The adjustment may therefore be made by observing the reflector, the light beam or the spot of light resulting on a screen or wall.

BIG BUILDINGS LOWERED BY SUBSIDENCE.—Interesting developments in the problem of surface subsidence resulting from mining operations were observed in Great Britain and France, according to George S. Rice, of the U. S. Bureau of Mines. At St. Etienne, France, mines have passed under important buildings which have been lowered as much as 20 ft. without material damage, because of the careful packing methods employed. The mine subsidence problem is one of growing seriousness in various European countries. The English Parliament has recently established a commission to study the situation, with a view to recommending special remedial legislation.

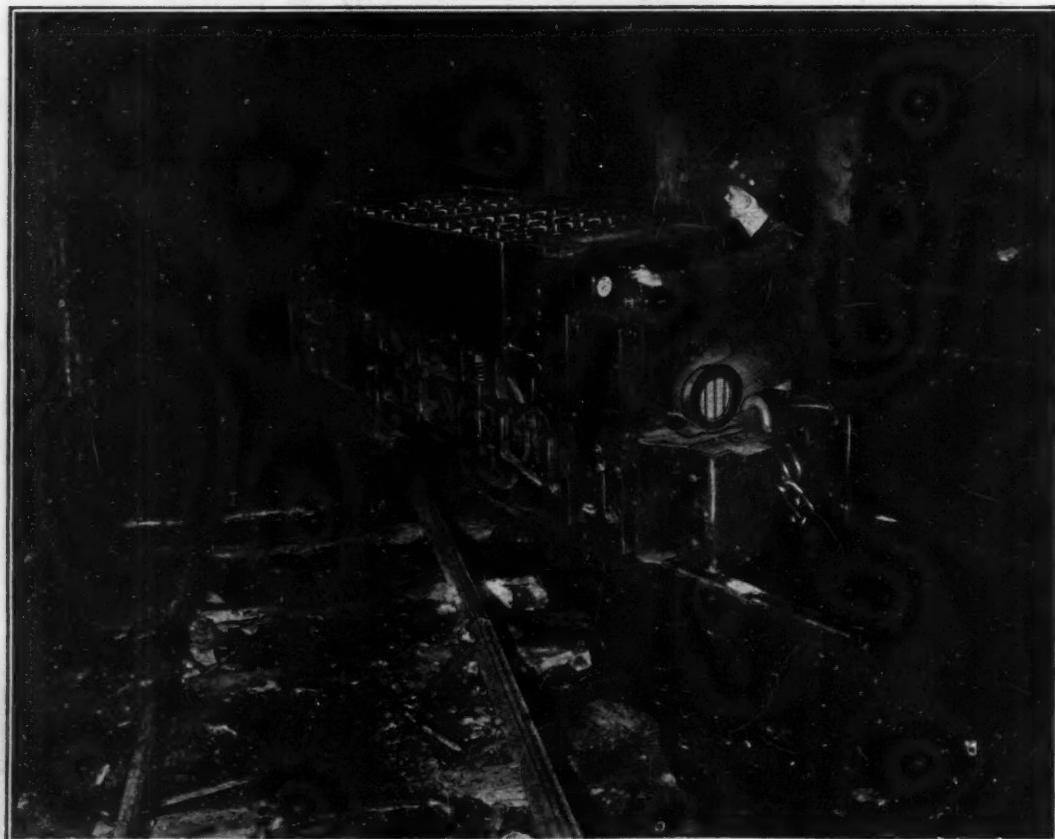
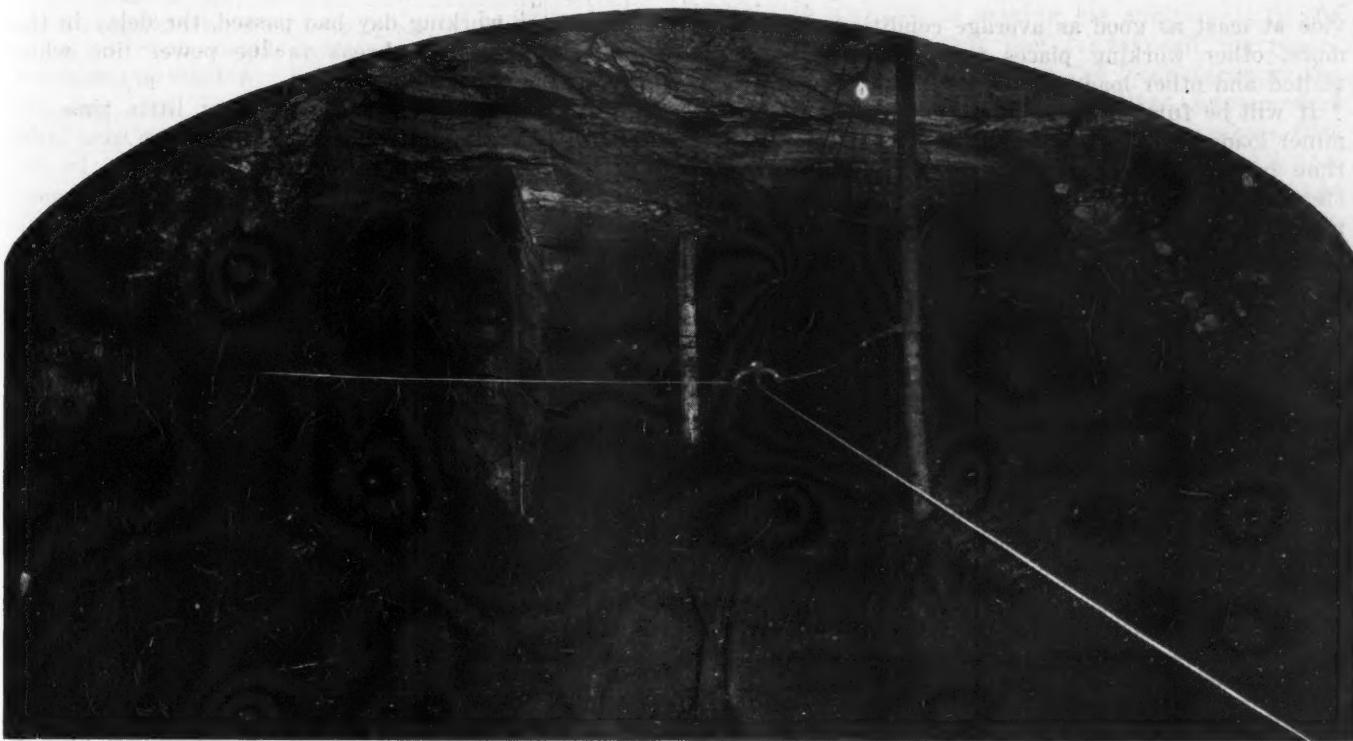


FIG. 10
Headlight on a Gathering Locomotive

Short turns, switching, coupling and door opening require a headlight with a broad beam for general illumination.



Wherever Roads Meet, Time Is Likely to Be Lost

When Loaders, Locomotives and Tipplemen Stand Idle Can Haulage Control Afford Them Steady Work? *

Lack of System Results in Loaders Being Idle One-Fourth, Main-Line Locomotives One-Third and Gathering Units One-Tenth of Duration of Shift—Haulage Control Would Save Time

THE effect of an irregularity in the supply of empties upon the work of the individual loader is shown in Fig. 1 for eight separate days in six different mines. The chart shows not only the time the loader lost waiting for cars but the irregularity in the time in which they were delivered to him. In general it will be noted that this irregularity becomes more pronounced during the latter part of the day. The time lost by each of these loaders, due solely to the fact that he did not receive cars, is shown in heavy black. The maximum time lost by any of the loaders noted was two hours and forty-five minutes in an eight-hour day and the minimum time seventeen minutes. The average time lost was one hour and fifty minutes, representing 23 per cent of an eight-hour day.

The upper jagged line for each mine shows by its three horizontal levels whether a car was being loaded (highest level); was loaded and waiting to be drawn out (level 70 per cent above base); or whether there was no pit car at the loader's place of work (40 per cent above the base line.) If the loader left his working place before the completion of eight hours (in addition to his lunch period) the rest of the eight hours is drawn with the upper line sloping downward, the reason for his quitting being indicated by the kind of

shading. Detail information regarding physical conditions and equipment in these mines may be found in subsequent tables in this report by reference to mine designations.

Referring to the mine DS at the top of the diagram we see from the downward verticals that the man loaded five cars. During the first four hours, though there were periods after each load was completed when he had no cars at the face, as shown by the lowest horizontal lines, he was busy on other work. After loading his fourth car he had to wait about twenty minutes for the next car and on loading the fifth car he waited about one-half hour, then learned from the driver that he would not be given another car on that day, and so quit work.

The driver gave as his reason for not giving this loader another car that he had had his turn and that he must give what other cars came in that afternoon to other loaders. At this particular mine the management claimed they had a sufficiency of mine cars to furnish the men at their places all the cars they needed for loading coal. The chart shows, therefore, that either this was an exceptional condition, that the management was misinformed as to the condition, or else did not use the right method in determining the number of cars necessary to provide the men all they needed.

It is believed that the conditions shown in the chart are not exceptional, especially as the natural tendency on the part of officials during a special test is to pro-

*Fourth Installment of Report on "Underground Management in Bituminous Mines" made by Stanford E. Thompson and associates to the U. S. Coal Commission. The three earlier installments appeared Nov. 8, page 691; Nov. 15, page 733 and Nov. 22, page 773. Other installments will follow later.

vide at least as good as average conditions. Furthermore, other working places in the same mine were visited and other loaders found waiting for cars.

It will be further noted that the time in which the miner loaded each car was fairly uniform, but that the time between delivery of the cars to him increased steadily from the first to the last. There was no particular plan or schedule of delivery of these cars, and the miner never knew in advance whether he would get an empty car in ten minutes or in two hours after his loaded car had been pulled.

The next three sections of the diagram show three consecutive days of the same miner in the same mine designated as *RM*. This record was taken to show a complete cycle of work from clean-up to clean-up. Note that for the first forty-seven minutes of his first day's work he had no car at his place, but at this stage of the cycle he had plenty to do and the failure to deliver him a car did not cause him to lose any time. During the balance of the first five hours of the day he was kept well supplied with cars, followed by a lapse of two hours and eight minutes during which he received no cars.

That only forty-seven minutes of this time was actually lost waiting for cars is due largely to the fact that it was still fairly early in the man's cycle and much other work remained to be done besides the loading of coal. Toward the end of the second day his periods of waiting for cars became more numerous, as he had more nearly completed the work of his cycle other than loading, and on the morning of the third day the greater part of the time during which no car was in his place was lost time to him.

On this last day we see that the loader quit after five hours' work because his place was cleaned up and there was no cutting machine available. At this mine also will be noted great irregularity in the time of the delivery of the cars and also a big variation in the time the miner took to load them.

In mine *TS*, where two miners loaded at one working place, is seen a great irregularity in time of delivery and a total of two hours and four minutes loss per miner during the day waiting for cars.

Mine *SP* represents on the whole probably the best conditions of management seen at any of the mines. This is borne out by the chart which shows no time was lost waiting for cars until after six and one-half

hours of the working day had passed, the delay in this case being due to a break in the power line which affected the whole mine.

Mine *AS* also shows comparatively little time lost waiting for cars, the haulage at this mine also being much above the average of those observed. In this case, the miner, who was an exceptionally skillful man, quit after loading five cars and earning \$8.60 because he was satisfied with his day's work. The ordinary rate of loading of this particular man, as shown by the payroll, was six cars per day.

Mine *OW* shows fairly regular delivery of cars, which came in pairs, but they never were delivered with such frequency that the miner could fill up his time in other work, and the miner, therefore, lost an hour and two minutes in the day for lack of cars.

Variations in haulage details at individual partings studied in various mines are shown in Table I with average maximum and minimum figures. Note the great variations in the number of miners cared for by each mule or locomotive at any particular parting as well as in the number of cars gathered per day. These variations, barring certain conditions in length of haul and grade, are due almost entirely to the lack of supervision or order or any studied planning or dispatching of the haulage system. A few figures also are given in this table showing the actual labor cost per ton for gathering coal at these partings and total time lost at these partings due to various causes.

Table II shows the operating time lost by four locomotives in a large mine in a day observed. Note that total waiting time is 34 per cent of the day.

Averages in Table III, made up from the material detailed in preceding pages show the average losses of total available operating time, due to the failure of the haulage system to function properly, which always occur in such work, especially under scant supervision.

General Principles of Haulage Control.—To bring out the faults of any scheme is of little constructive value unless one can reach down and determine the basic principles at fault and indicate the general lines along which improvements may be accomplished. A side light is thrown on mining by comparison with manufacturing industries. Not long ago a past president of the American Society of Mechanical Engineers speaking on

TABLE I—VARIATIONS IN HAULAGE DETAILS IN DIFFERENT MINES AT INDIVIDUAL PARTINGS

Mine	AS			OW			DS			RZ			GH			TS			RM				
	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.		
Number of cars per trip main line.....	10.8	18	5	21.9	22	20	26.0	31	18	19.0*	26*	13*	38.6†	55†	33†	18.5	25	10	no record	(see note)			
Average weight of coal per car, lb.....	5,200			4,420			2,650			8,450			5,720			3,760			3,700				
Number of locomotives or mules from parting				1 five-ton loco.				4 mules			7 eight-ton locos.			3 six-ton locos.			2 mules			1 six-ton battery loco.			
Number of loaders per mile or locomotive.....	11.6	13	10	8.5	10	7	16	23	12	20	36	5	18	23	16	16	650	650	20	1,100	different		
Gathering distance...							2,440	2,800	1,950	1,190	1,600	1,100	1,600	1,850	1,200	650	650	650	1,200	parting 900	(see note)		
Cars per day per mule or locomotive.....				88	107	69	39	49	31	57	78	20	66	82	57	48	51	46	30	19	{ different 19 { partings 19 { (see note)		
Tons gathered to parting.....	280.8			889	652	236	206			1,680			570	570		182			126				
Labor cost per ton, gathering.....							7.3c.				6.6c.			8.4c.			8.2c.			12.0c.			
Time lost in a day awaiting empties at parting.....				91 min.				72 min.				283 min.			108 min.			201 min.			10 min.		
* Single locomotive † Two locomotives.																							

Note—At mine *RM* one battery locomotive gathered the mine cars to three separate partings, from which they were hauled by the haulage locomotives. The gathering locomotives, besides gathering the cars to the three partings from the three different groups of miners, had also to travel back and forth on the main-

line tracks a total distance of 2,300 feet between the partings. The number of cars per trip taken by the main-line locomotive was not recorded as it gathered from many different partings besides the three to which this battery locomotive gathered.

TABLE II—OPERATING TIME LOST BY MAIN-LINE LOCOMOTIVES IN A LARGE MINE

Average of four locomotives	Per Cent of Total Time
Running time, main line.....	43
Switching time, bottom.....	13
Switching time, partings.....	8
	—
Total useful time.....	64
Held up by loaded cars.....	17
Awaiting empties.....	5
Awaiting loads.....	12
Total waiting time.....	34
Total time lost in making repairs.....	2
	100

the "Science of Engineering," and leading up to the recent developments in the science of operating management, stated that he could "remember distinctly the time when an educated scientific mechanical engineer was looked upon with profound suspicion by practically the whole manufacturing community."

The mining operator appreciates the engineer in so far as his work relates to design and layout. But our studies show that with a few exceptions, the mine below ground is in the same stage of development as was the manufacturing industry before it arose to an appreciation of the place of science in management.

The conditions in underground haulage which have been illustrated exist because fundamentally mine officials still fail to appreciate the need for keen analysis in each individual mine of all of the different variables and fail to see the need for the installation and the operating maintenance of routine plans which may involve the employment of a clerk and a little paper work, a thing abhorrent to the old-fashioned mining official.

Care must be used to see that any plan adopted is not merely left to run itself, as is so often the case in all industries where such work is the result of somebody's "hunch" instead of being based on definite principles. In one mine visited, for example, the management pointed with pride to a blackboard at the parting, on which were a number of figures.

Quoting from the report of our industrial mining engineer: "The general superintendent directed the trapper who kept it to explain it to us. The trapper replied that he kept a record of the number of cars that each gathering locomotive pulled by jotting down how many it brought out in each of its trips. The general superintendent then said 'Tell them how you kept your record of the number of the men each locomotive is pulling from.' The reply was, that was obtained by asking the driver, the figures being put at the top of the board, but that the driver hadn't reported yet that morning.

"We went on further into the mine, and as we went the superintendent explained that by getting such records every night a close supervision of the haulage system was kept at the office. Later when the superintendent had left me, I went back and questioned the trapper who kept that particular board. I noticed that still no figures appeared of the number of loaders that were being supplied with cars in the course of that day and I asked him if the driver had not reported yet. The reply was 'Oh, I don't keep that any more. They started this _____ system a few months ago and I kept it for a week, but one morning the driver didn't tell me the number of men in and I forgot to ask him, and I never kept it after that.'

"I watched him for a while, and within an hour he made three mistakes in putting down on the board the figures of cars hauled, one in the actual number of cars

brought in and two in making his additions. In the mine office the following day I examined the report made from the figures kept on the blackboards at the partings. For some of the locomotives, figures were given as to the number of loaders from whom they were hauling. In other cases the spaces were blank, but after each appeared the number of cars hauled the previous day.

"Disregarding any special cases of locomotives pulling from gangs on development work, the figures showed one locomotive pulling from anywhere between thirteen and thirty-five men and from forty-six to one hundred and twenty-six cars. Such a report had been going to the superintendent's desk daily for several months, and apparently the manager believed that thereby he was exercising close haulage supervision, yet underground, as a matter of fact, haulage locomotives were running without schedule, blocked by cars, and pulling greatly varying loads. Gathering locomotives and their drivers were waiting for empties and operating with widely different efficiencies. Miners, meantime, were waiting for cars!"

The plan failed because of the disregard of fundamental principles in management, for in the first place planning was not differentiated from operating, and in the second place the plan was simply an accumulation of the records of what had been done, instead of a conspectus of what it was advisable to do.

EACH MINE MUST HAVE PLAN TO SUIT ITS NEEDS

No method of procedure to be followed for the installation of a scientifically planned and dispatched haulage system applicable to all mines can be outlined in a report of this nature, nor can methods be laid down for a particular case that might not have to be modified as the work proceeded. Furthermore, in practice, as is discussed later in this division of the report, any plan should be tied in with, and form a part of, a comprehensive scheme which includes with the co-operation of the miners the analysis and planning of the work of all the men in the mine for the purpose of bringing more clearly before the operators and miners the general principles involved in planned and dispatched haulage from an engineering standpoint.

TABLE III—TIME LOST IN A DAY THROUGH LACK OF SYSTEM IN HAULAGE

	Hours	Minutes	Per Cent
By the miner at the face.....	1	50	23
By the gathering locomotives and drivers.....	0	44	9
By the main-line locomotives and drivers.....	2	43	34

That the problem is no simple one is indicated by the principal factors that must be considered: Capacity of the hoist or main haulage equipment; capacity at bottom; empty-car track capacity at same point; capacity of partings; location of working places with reference to each other and to the partings; location of partings; grades on haulage roads; number and location of miners in rooms and entries; number and size of locomotives and cars; weight and condition of tracks and length of hauls; distance of main partings from shaft or drift mouth; size of room; mining conditions as affecting rate of mining and such local rules and practices as affect the foregoing conditions.

It should be noted at the start that of these major factors affecting the haulage problem all are susceptible to modification by the operator, with the exception of the major grades on the haulage roads, mining condi-

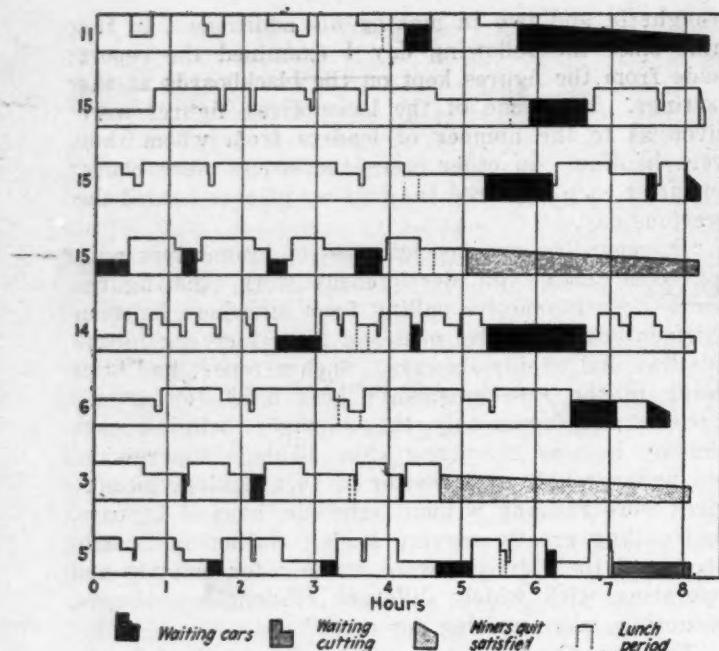


FIG. 1—ANALYSIS OF SOME MINERS' WORKING DAYS
Only peaks show loading times, loaded and waiting is the level below the peak and no car in place the lowest level of all. The sloping lines show time in which miner has left his place satisfied with his day's work.

tions as affected by law or the physical and geological characteristics of the coal seam.

The problem in every mine resolves itself in its primary aims into the necessity of providing the required number of empty cars to each miner at the time he needs them and hauling the full cars to the parting, and thence to the bottom or to the tipple and returning the empties into the mine without permitting congestion at any point, the number of miners to be regulated by the production desired. In each case the problem can be solved by a thorough analysis that will determine the facts. In this analysis not the costs but the actual time should be ascertained. Thus equipped a good working plan can be devised.

In a few mines are to be found the rudiments of transportation control. Reference has been made to the mine SP, Fig. 1, where the supply of cars is exceptionally uniform. This is not mere chance, for this mine employs a traffic foreman underground. Many mines have their haulage practice so definite that the management knows early in the morning what working places are available and the expected tonnage for the shift. They also know the number of men in each section, and where excess, if any, can be used, so that they have at least a part of the information needed for the dispatching of cars.

In other mines which we found to be the best organized and lowest in operating costs for given physical conditions, these various elements had been studied and a traffic man designated to supervise in a general way the running of the trips. With an extension of these duties, in accordance with recognized practice in manufacturing, naturally comes the noting each day* of the location of active working places and of the men working; the allocating of drivers and locomotives with the formulation of definite schedules of trips and number of cars to the trip; co-ordination of the work by telephone communication to supplement these plans

just as in a factory. There the production man—that is, the planning official—keeps in touch with the production and changes details as needed, while maintaining always his general scheme.

While details may be left to local treatment, such general principles as these apply to all mines. They are in accord with the policies of control that are being followed by the best industrial organizations in all industries. The adoption of these will go far toward relieving one of the most potent sources of friction between the miner and the manager by furnishing an equitable delivery of mine cars to the loaders.

Tendency to Minimize Importance of Haulage Control.—That the mine manager gives too little attention to the problems of efficient underground haulage is due in part naturally to the fact that when a loader waits for cars, or consumes—by reason of the management's demand that the cars be excessively topped—additional time over that required for straight loading, he alone stands the primary loss because he is on a tonnage or piece-work basis, and when he is idle he presumably is not costing the company anything.

On the other hand, the larger the load per car, the lower the apparent haulage costs per ton. In this neglect of the management to insure the maximum production desired by the miner, the fact is overlooked that any lost time of the miner, such as that caused by lack of cars or excess topping, is eventually reflected in demands for increased rates of pay.

A rather common viewpoint of the operator is expressed in the following communication from an executive of a large Western mine. Although this is written in connection with a statement on machine loading, an interesting feature is the reference to the haulage problem:

"The outstanding difficulties suffered are those occasioned by the persistent resistance to the use of power shovels made by the mine workers, backed by the force of their organization. A continuous controversy rages regarding the distribution of empty cars as between the hand loaders and the shovels, the men demanding that cars be placed when and as they want them, the speed used in loading out cars in individual rooms varying 200 per cent or more, the hand loaders demanding that such preferential service be given them as will admit of their loading out what they consider their daily quota in less than eight hours (never more than 6½ hours), failure to meet this demand resulting in the shovel operators so handling their work as to cause delays of one or two hours per day to the shovel and its crew, including the room driver engaged in placing empty and loaded cars."

Without in any way condoning this antipathy to the power shovel it may well be questioned, judging from the way it has been found possible to handle similar irregular conditions in other industries, whether the operator on his part should not manage the haulage problem so that the miners will receive such cars as they require notwithstanding a variation in demand.

Savings in the productivity of labor not only reduce overhead but tend eventually to lower unit labor cost. In fields where both tonnage rates and the day pay of company men are fixed regardless of physical conditions, the results become effective more slowly than where there is greater freedom to reward a man for conscientious effort, but in both cases the eventual result will be the same.

*Perhaps by pins on a mine map as is done in one or two instances, or by further utilizing the check system.

Why the Coal Industry Of Great Britain Functions Smoothly



Car Shortage Unknown—Few Mines Work One Shift—Priority in Use of Cars Would Cause Riot—Storage and Profit-Sharing Stabilizing Factors

BY PAUL WOOTON

Washington Correspondent of *Coal Age*

THE reason why Sir Richard Redmayne was selected to serve as chairman of the coal-mining organization committee of the United Kingdom during the war is apparent before you talk with him long. Like most of the other busy men I met in Europe, he was willing to make any sacrifice of time if he could contribute to a constructive effort. Nowhere did I meet a coal man in the United Kingdom who was not willing to lay his cards on the table once you had established the fact that the material was to be used in an effort to benefit the coal industry.

I was apprehensive before I went that they might be inclined to have little to say on the ground that it would be giving a competitor the advantage of their experience. This was not the case, however, despite the fact that American competition is being felt much more keenly than our export tonnage warrants. It is quite evident that they fear our potentialities in that direction. During my stay in Cardiff, sales of American coal were made in France, in direct competition with Welsh interests, and while I was in Newcastle, American bidders were successful in Holland—a market that has been almost exclusively Newcastle's for a generation. They were somewhat chagrined at our success in those markets and they were at a loss to understand how we could quote the prices we did.

I encountered many readers of *Coal Age*. In several offices the well-thumbed copies indicated that they were read by the entire staff. Sir Richard keeps the more recent copies on his desk for ready reference. Judging from the influx of subscriptions from British sources since my return I assume that my visit suggested that now is a good time to begin the exchange of helpful information and that they want to be sure that the Americans are not the only ones to profit from it.

AMERICAN COAL MEN COULD EMULATE BRITISH

In most particulars the coal industry of England and Wales functions better than does the bituminous industry in the United States. While it is true that the production and distribution of coal there are not entirely comparable to those activities in the United States, it is apparent that there are many leaves we could take from the book of British practice and experience with great advantage to ourselves. This does not mean that the industry there does not have grave troubles, but some of the difficulties from which we suffer have been ironed out.

Car shortages practically are unknown. Mines never have to suspend operation for lack of cars. The longest period of idle time during the year is three days and that is to allow the workers their Easter holiday. There are few mines which work only one shift. It is true that the average haul in the British Isles is short, but there is careful co-operation of all concerned to

obtain a quick turn-over for the coal-carrying equipment. This keeps available a sufficient surplus of cars which can be used for storage purposes when ships are overdue or other delays develop. In addition, provision is made for some storage at the mine. There are instances where several days' output can be put on the ground near the pit mouth. This storage is arranged so that the cost of handling is kept at a minimum.

For a railroad to be given priority in the use of cars for hauling its own fuel is entirely unheard of. If there were stringency in car supply and were a railroad company to attempt to give a disproportionate number of cars to a mine with which it had contracts, it would cause a riot, to quote the words of M. W. Magee, an operator in the Newcastle region. No such attempt ever has been made and would not be brooked.

CONSIDER RESORT TO PRIORITY INEXCUSABLE

The railroads, a number of British operators told me, least of all should have to resort to such priority. They can conceive of a small enterprise, not in a position to hire engineers and skilled purchasing agents, failing to make adequate provision for an unexpected stoppage in its coal supplies. There would be some patience with a proposal that it be allowed some preference in obtaining an emergency delivery, but for a large concern like a railroad, methodically conducted and with staffs of engineers and technical men, to fail to have adequate storage at strategic points would be inexcusable. For a common carrier, on which the prosperity and even the health and comfort of the public depend, to be without large storage and to have to depend on priority and car supply is more than the British can understand.

Next to the adequate supply of railroad cars and motive power, the general practice on the part of consumers in storing coal is the most important factor contributing to the enviable stability of the British industry. It is an inherent trait in the British engineer and commercial administrator to provide very liberal margins of safety. Large stocks of coal are maintained by the railroads and most other consumers. Even the householder is less inclined to buy from hand to mouth or to wait until the last minute to lay in his fuel.

On a railroad, for instance, when stocks begin to decrease somewhat, the line comes into the market regardless of any prospect for lower prices. A certain reserve always is maintained. This varies with the locality, but no matter how unfavorable the market situation may be, stocks are not allowed to go below a definitely established point. The same policy is followed at gas works—consumers using a much larger portion of the output than in the United States. The British gas industry represents an investment of \$750,000,000. Other public utilities and manufacturing plants generally stock heavily. The same tendency ex-

ists among retailers. Large stocks are maintained throughout the year. This practice is regarded as being largely responsible for spreading the demand on the mines more or less evenly over the twelve months. There are certain peaks but the peak is much more likely to be caused by influences other than such seasonal demand as exists.

The profit-sharing wage unquestionably is another stabilizing factor. Much criticism of it is heard, but it emanates from an assertive minority. Labor is inclined to be critical of it, but it is noticeable at showdowns that it is amendment rather than abolition that the union wants. Some of the union leaders—leaders of the agitator class—see in the profit-sharing plan some menace to organization. They fear that some years hence the relationship will have become so standardized and will work so well that the principal benefit received from the union—periodic boosts of wage—will not be required. The more substantial of the labor leaders, however, recognize that there always will be impelling reasons for the men to maintain their organization.

In South Wales the operators, after more than thirty years of rather successful use of a sliding scale, based on the selling price of coal, were not inclined to give it up. Many of them still are outspoken in opposition to the new agreement. Nevertheless the opposition is passive and the real truth doubtless is that they are fairly well satisfied with the principle underlying the present arrangement.

In Northumberland and Durham, on the other hand, sentiment among the operators for the profit-sharing agreement is very strong. The mine worker no longer is wasteful, as he recognizes he is a greater loser than the mine owner. He does not throw away a prop, for instance. He saves it and uses it because five-sixths of the prop's value is his. Incidentally mine props there are more valuable than here. Supplies come from Nova Scotia and other distant sources. The miner does not load dirty coal because he realizes that most of the penalty will come out of his pocket.

Labor also is making some capital out of claims that the operators are concealing profits. In some instances, it is asserted, the operators also are interested in ships

and in brokerage companies. Because of those interests they are willing, some representatives of labor say, to sacrifice profit at the mine and recoup themselves from the profits made in further handling. In that way, it is maintained, labor loses its just share of profits. The contention hardly is sound, however, as labor is represented on the auditing committee, which has full access to each company's books. Any acceptance of prices out of line with costs would be detected immediately. There are some cases, of course, in which the operators of a mine also are interested financially in shipping, brokerage or coal-consuming enterprises. There may be some instances in which that fact influences to a slight extent the price at which the coal is sold. The tonnage to which this would apply, however, is negligible.

The objections to the profit-sharing plan apparently are diminishing as it is becoming better understood. Evidently it will survive and promises to become the greatest development of the last hundred years in industrial relations.

Next week Mr. Wooton compares the sliding scale with the profit-sharing wage plan now in vogue in Great Britain.

Officials Inspect No. 14 Colliery Pennsylvania Coal Co.

AT A RECENT visit of the officials of the Pennsylvania Coal Co. to No. 14 colliery, at Port Blanchard, the mine was closely inspected, the party being divided into five sections which visited every part of the operation. Each section had a leader who was charged with the duty of preparing a report on the part of the mine visited. A photograph was taken of the visiting party of fifty men in front of the colliery office. From this the accompanying illustration has been made. Special interest attaches to the inspection this year as the new steel and glass breaker, one of the most modern in the anthracite region, is just being completed. The steel work and glass are all in position, and finishing touches are being placed on the interior of the structure. The steel and glass exterior incloses not only the breaker proper but also the loading chutes.



OFFICIALS OF PENNSYLVANIA COAL CO. ON INSPECTION TRIP TO COLLIERY NO. 14

Practical Pointers for Electrical and Mechanical Men

Reasons Why Power Generated at Mines May Be Inherently Uneconomic

REFERRING to the letter of Mr. Butcher, which appeared in the Nov. 22 issue of *Coal Age*, I would like to point out some inherent disadvantages of small and large degree which must be considered in a coal-mine power plant.

Mines having a daily output of 2,000 tons are rather common in the industry, but those having a daily output of 6,000 tons are extremely rare, and these, with few exceptions, are well equipped from every angle.

Actual practice has fully demonstrated the fact that central-station power is cheaper than power generated in a privately owned plant of the most modern character for the operation of a coal mine. The only objection to the use of electrical energy as supplied by public utilities has been the question of continuity of service, but this has been solved or is being worked out by the duplication of sources of supply.

Mixed-pressure turbines have been tried at coal mines but have not proved satisfactory as a general proposition, although in a few special cases they have given fair results over short periods of time. This does not condemn the mixed-pressure turbine, but does eliminate its use at coal mines.

Reliability and simplicity of steam consuming equipment at a coal mine is infinitely more important than high efficiency engines. In general, mining plants are of necessity so located as to render the use of condensing equipment of doubtful value in any case because of lack of sufficient water. In large underground steam-pumping stations the use of condensers may have value, but for other coal-mine applications they are not economical.

If it is necessary to operate a steam-driven ventilating fan at full speed over the entire 24-hour period, it is essential that the engine be in duplicate and of extremely rugged design with as few parts as possible, as reliability of operation is really the thing to be considered. The exhaust steam from such a fan would be available for an exhaust turbine if it were practicable to use it.

The steam used in hoisting engines is not available because of the relatively small amount used over the 24-hour period, the wide fluctuation in the load and the incidental cost of an installation that would permit its use.

The engines used to drive generators also produce a widely fluctuating load and the load factor of delivered energy usually is well below 20 per cent. It is, therefore, evident that this is no place for condensing equipment.

The present design of a steam plant at a coal mine

represents the best practice known for this particular class of service and is the result of many costly experiments and careful study. The factors that affect the design of a steam plant are load factor, life of plant and reliability of operation, as well as first cost and cost of operation. Because of the fact that a mine works only eight hours per day for 200 days per year, and in many cases less, the load factor is inherently low, usually being below 20 per cent.

Coal mining represents a constantly changing condition, with the result that the power requirements change from year to year and any arrangement becomes obsolete in a very few years. Because of the short life of the equipment, the increased first cost, as well as maintenance cost of so-called highly efficient equipment, its use is not warranted.

Because of the low load factor existing at coal mines and the demand for a flexible power supply to take care of the constantly changing conditions, central-station energy as supplied by public utilities can be purchased at a lower cost than power generated in a privately owned plant, serving one or two mines regardless of the design of the plant. This is not a theory but a fact based on the actual results obtained over a considerable period of time.

Pittsburgh, Pa.

CHARLES M. MEANS,
Consulting Engineer.

How Electricity Is Produced

ALTHOUGH we do not know what electricity is and we frequently hear it said that it is in its infancy, we know many facts about it. The laws governing its production, or, in other words its generation, what it does under certain circumstances, how to govern its action and how it may be applied to useful work, are all well defined. The feeling of mystery concerning electricity seems to be unwarranted. Steam has been in use for many years, yet there are certain aspects about steam and its application which are as mysterious as many things pertaining to electricity; in fact the laws governing electricity are more extensively known and

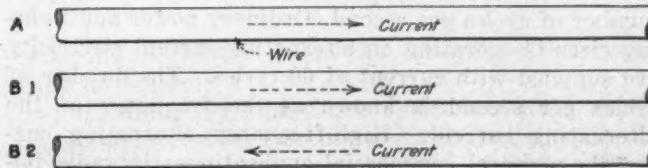


ILLUSTRATION OF DIRECT AND ALTERNATING CURRENT

At A the current is continually flowing from left to right, as indicated by the arrow, and represents direct current. At B₁ the current flows from left to right for only a short interval of time. B₂ shows the same wire as at B₁, but at another instant, showing that the current is now flowing in an opposite direction. This change of direction of current alternates; hence it is distinguished from direct current by being called alternating current.

understood by scientists than the laws of steam. The word electricity comes from the Greek word amber, and its development has come from the fact that the Greeks discovered that when amber was rubbed it had a property that caused it to attract light bodies. Later this attractive force possessed by rubbed amber was found to be a form of electricity.

There are several different forms of electricity and several ways of producing it. Two common forms in which we find electricity are static or frictional and current electricity. The three most common methods of producing it are by friction, chemical action, and by induction.

HOW TO PRODUCE ELECTRICITY

Static electricity is generated by friction. Rubbing a stick of sealing wax and a piece of flannel or a glass rod and a piece of silk will produce static or frictional electricity. It may also be produced by a comb rubbed in the hair, stroking cat's fur or by a person rubbing his feet over a carpet. When electricity is formed by any of these methods one of the two different substances becomes charged with what we call positive electricity and the other with negative electricity. These two charges attract each other while bodies charged with like electricity repel each other. This establishes a general law which may be stated as follows: Bodies charged with like electricity repel each other, and bodies charged with unlike electricity attract each other. The uses of electricity in the static form are not of great practical importance, except at high voltages. Lightning is a form of static or frictional electricity of very high voltage.

Current electricity, as we have stated before, is generated by chemical means or by means of induction. Electricity is generated by chemical means in what is called a voltaic cell. Inside the cell a chemical action takes place which releases the chemical energy in the form of electrical energy. Electricity generated by chemical means is unidirectional and is called direct current.

Electricity produced by induction usually is generated in a machine called a generator or alternator. When generated by induction it may be direct current or alternating current. It is generally understood that direct current is generated in what is called the generator and alternating current is generated in what is called an alternator. Alternating current is one which reverses in the direction of its flow a number of times per second. An alternating current which reverses its direction 120 times per second is called 60-cycle alternating current.

CYCLE OF ALTERNATING CURRENT

A cycle is two alternations. Obviously the more rapid the alternations or changes of direction of current in the wire carrying alternating current the larger the number of cycles per second. Ordinary power and lighting circuits operating on alternating-current electricity are supplied with current of 60 cycles. The number of cycles per second is known as the frequency of the alternating current. High-frequency alternating current has several commercial applications; in radio telephony alternating current of 1,000,000 cycles per second is common. It is the frequency of the transmission voltage which determines what is known as the wave length of a sending station.

To visualize direct and alternating current we may

think of water in a water pipe. If this water is flowing in one direction continually it represents what is understood as direct-current electricity. If the water alternates in the direction of flow it represents what is known as alternating current.

Advantages of Purchased Power

THERE is still much discussion at many coal-mining properties on the subject of purchased power versus power made at the mines and therefore I wish to present a few of the advantages of purchased power to the readers of *Coal Age*.

Wherever purchased power is available it usually will be found to be more economical for the mine operator to purchase power for his use, because of its reliability and ultimate low cost.

How many times a year does purchased power prove itself the more reliable? With power generated at the mine a serious burn-out of electrical generating equipment or a breakdown of some of the other machinery in the power house will frequently mean long and costly delays. With purchased power it is nearly always possible to resort to spare equipment located in the power house when such emergencies arise.

Purchased power usually is cheaper for the operator because it does away with the necessity for experienced power-plant attendants, which always are necessary where power is generated at low cost. Then again, the power bill of the power company is not a complete item of expense to the operator because he must credit himself with the additional amount of fuel he is placing upon the market since he is buying his power instead of making it himself. A mine often is located where water must be pumped a considerable distance for the boilers, which means a large item of expense to the operator making his own power.

Many times the mine operator will have to install transforming equipment for reducing the delivery voltage of the power company to his requirements, but rarely does this equipment cost a great deal; in fact, many such substations are frequently installed by the power company and charged off to the mine operator as small monthly payments included in his power bill.

Apparently purchased power has many advantages which are of interest to the small and large mine operator.

NATIONAL ELECTRIC CO.

Charleston, W. Va.

WILLIAM SCHAFFER,

Electrical Engineer.

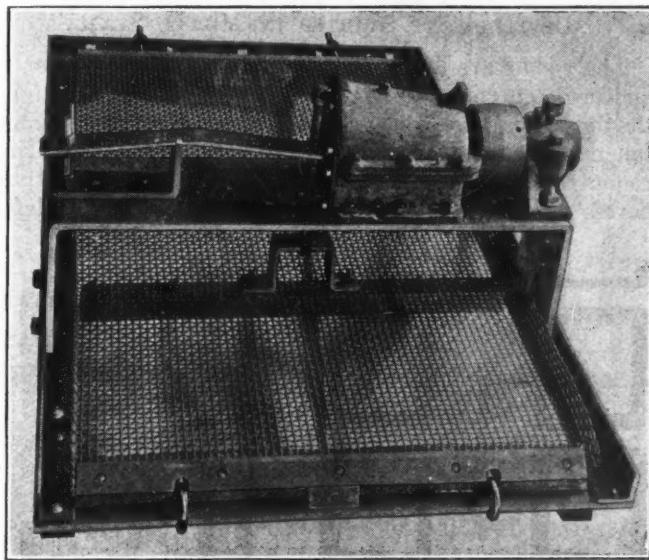
PROFIT SHARING AT BRITISH MINES.—An interesting sociological development in the coal-mining industry of Great Britain, whereby the mine owners and the miners share in the distribution of profits, is reported by George S. Rice, chief mining engineer, U. S. Bureau of Mines. Under this plan the mines are grouped in districts and monthly, in each designated district, the gross expenses of production of the coal are deducted from the gross profits of the mines of that district, and from this gross net profit 6 per cent of the invested capital is deducted, the remainder, if any, being divided between the owners and miners, the owners receiving 17½ per cent and the miners 82½ per cent. The miners' share, if any, is pro-rated among the miners of the district, and the sum thus determined by certified accountants is paid to the miners two months later in the form of an increase in wages.

New Equipment

A Small Screen with Large Capacity

GRAVITY screens must be built long or they are ineffectual. The shaking screen has a greater capacity per square foot and is more efficient than the gravity-operated unit, but the vibrating screens are said to exceed both, not only passing a greater tonnage per unit of screen area but making also a more complete separation of fines. The main difficulty is with wet material.

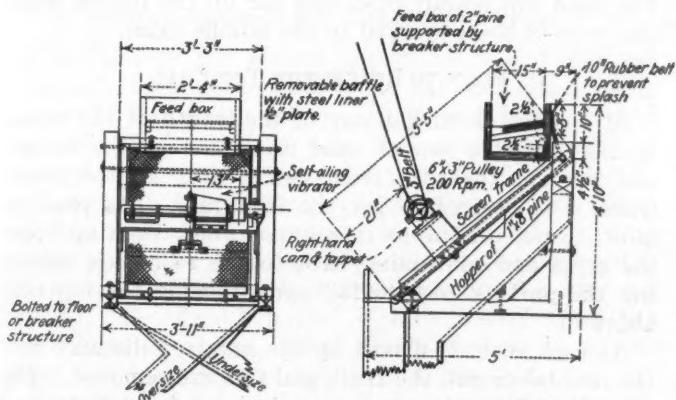
A screen that is said to have given excellent service with both wet and dry fines is the Leahy No-Blind Screen of the Deister Concentrator Co., Fort Wayne,



SCREEN THAT CLEANS ITS OWN MESHES

Constant vibration of the screen keeps the material from building up in the opening and changing the screen into a mere chute, as too often happens with a screen which operates only by gravity or with the aid of shaking mechanism.

Ind. It is said to give a quick return differential vibration that is transmitted to the entire surface of the screen cloth so that the particles are screened and stratified according to their relative masses, and the finer particles pass through the screen without hindrance by those which are oversize.



SCREEN AS INSTALLED IN TIPPLE OR BREAKER
It is only 5 ft. 5 in. long and its projected length is less than 5 ft. so that a real economy of space is attained.

The anvil action at the end of each quick return stroke clears the meshes of the screen cloth so that the screen is non-blinding under all conditions of feed. The vibrator runs in oil and has only two wearing parts. The screen is driven by a 3-in. belt and requires $\frac{1}{4}$ to $\frac{1}{2}$ hp. A single spring adjustment controls the intensity of vibration and adjusts it to suit the load and the material being screened. The screen cloth is held in longitudinal tension by two bolts and can be changed in five minutes time. Any wire-mesh screen cloth may be used. With the vibrator driven at 200 r.p.m. 1,600 quick-return differential vibrations are transmitted directly to the screen cloth. The normal amplitude of the screen vibration is $\frac{1}{16}$ in. directly under the vibrator.

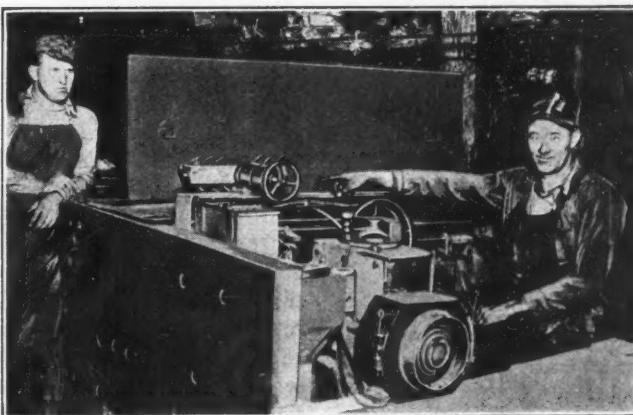
Safety Grease Lubricator

THE Keystone manifold safety lubricator presents a method of applying grease under high pressure with pipe-line distribution to more than one bearing. It accomplishes this result without risk to the operator or waste of grease.

Bearings that are difficult of access due to small clearances between working parts, heat and other unfavorable conditions, are made easy to reach by this medium of lubrication, thus insuring the proper lubrication of bearings that otherwise might be neglected because of inconvenience and hazardous conditions.

Heavy flexible metallic tubing is frequently used for the leads from the manifold to machinery bearings. By means of valves on each outlet the lubrication of any bearing may be regulated. In some instances valves may be permanently adjusted to allow the grease to flow in uniform quantities to all the bearings whenever the lubricator is operated.

This lubricator is designed not only from a standpoint of economy but to safeguard employees while oiling and



LOCOMOTIVE WITH MANIFOLD LUBRICATOR

Flexible pipe lines leading from the manifold to all the bearings insure proper lubrication at all times. Merely turning the handle with the valves open forces grease to any desired location on the locomotive.

greasing machinery where there may be an element of risk in the work.

For mining machinery this device has many applications, especially on hoisting and locomotive equipment, which is difficult and hazardous to lubricate. Proper lubrication of equipment will thus avoid serious breakdown delays, accidents and waste.

The complete outfit is sold by the Keystone Lubricating Co. of Philadelphia, Pa.



Problems of Operating Men

Edited by James T. Beard



Working Three Contiguous Seams With Rock Partings

Proposed Plan Impracticable—Insufficient Space to Store Waste Material—Another Plan Described That Has Given Success

HAVING had some experience in working contiguous seams of coal separated by rock partings of varying thickness, it has been with much interest that I have followed the discussion started by the inquiry that appeared in *Coal Age*, Aug. 9, p. 219. Following is the section of the strata described in this inquiry:

Starting from a footwall of hard sandy shale, a 12-in. seam of clean coal is overlaid with 2 ft. of hard slate parting, which separates it from 3 ft. of hard splint coal forming the middle seam. Another parting of hard sandy shale from 4 to 6 ft. in thickness separates the middle seam from the upper coal, which is $3\frac{1}{2}$ ft. in thickness. This top coal is overlaid with a hard sandstone roof.

Kindly permit me to offer a friendly criticism of the plan proposed by the inquirer and which he regards as promising a successful method of working these three seams, with a view to securing a high percentage of production and a good marketable condition of the coal. Following that, I want to describe a plan that appeals to me as certain of meeting every requirement, including safety and economy of working.

WHY PROPOSED PLAN IS IMPRACTICABLE

In the first place, the proposed driving of double or triple rooms, from 60 to 90 ft. in width, between a sandrock roof and a hard shale footwall is, to my mind, impracticable. To drive rooms 90 ft. wide separated by

50-ft. pillars of hard splint coal would tend to produce a creep. Or, driving 60-ft. double rooms with the same pillars between them and, brushing the two roadways to the footwall, each 10 ft. wide, would not provide sufficient space for gobbing the rock between these roads.

Allowing the ratio of rock in the solid to rock broken as 4:7 for each foot of advance, the 2 ft. of rock partings taken from the two roads would occupy $2 \times 10 \times 2 \times \frac{4}{7} = 70$ cu.ft. Then, deducting the two 10-ft. roads in a 60-ft. room leaves 40 ft. of space available for stowing. This, in a 3-ft. seam, gives $3 \times 40 = 120$ cu.ft.

Even if the rock is packed with the utmost care, it will be found that there will not be room to hold the waste rock. Moreover, only $33\frac{1}{3}$ per cent of the bottom coal will be recovered at a great expense of labor; and,

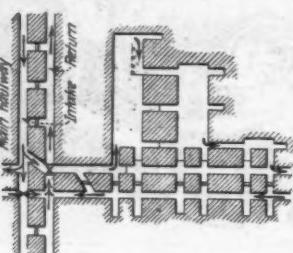


FIG. 1—GENERAL PLAN, SHOWING DOUBLE 50-FT. ROOMS

in my opinion, it will be impossible to work the top coal at all by this method.

Briefly described, my plan would be to abandon entirely the idea of mining the bottom seam, except for the coal taken out in the headings and roomnecks. As shown in Fig. 1, I would drive double rooms 50 ft. wide with 60-ft. pillars between them. Driving the roomnecks 10 ft. wide for a distance of 10 yd., leaves a pillar 30 ft. square in the neck of each room. The crosscuts in the room pillars are driven on 60-ft. centers.

DEVELOPMENT STARTED IN MIDDLE SEAM

The rooms are driven in the middle seam. The main and cross-entries are driven 10 ft. wide and 6 ft. high, the lower parting and the bottom seam of coal being taken up on these entries and the rock loaded out. The rooms are driven up from 200 to 250 ft. and well timbered, as indicated in Fig. 2, in the plan on the left.

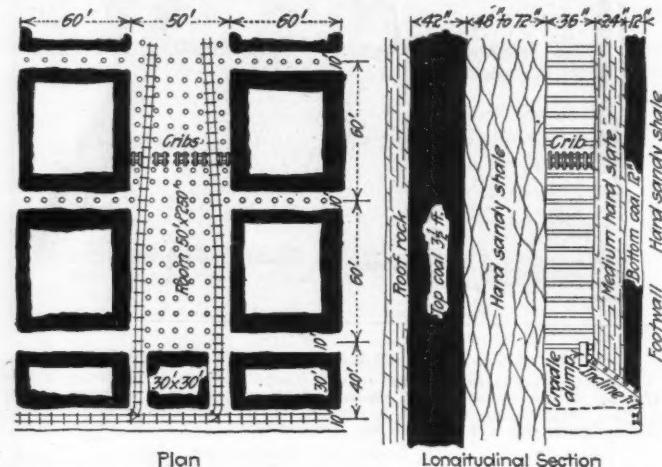


FIG. 2—PLAN AND ELEVATION WORKING MIDDLE SEAM

As shown in the elevation on the right of Fig. 2, starting a short distance inside of each roomneck, an incline pitching about 1 in. 7 is driven up to the middle seam. A special low car is used holding about one ton. Two men can readily push this car up the incline when the room is being worked in the middle seam.

PLAN TO REACH THE TOP COAL

At a point about halfway of the length of the room, is now placed a row of good cribs to take the weight and prevent the rock from riding over all the props when it is desired to get the first fall. The plan is, later, to pull the props in regular order, starting from the cribs and continuing back to the roomneck, allowing the parting rock to fall and probably the top coal above it.

As each room is driven up the required distance and the coal taken out, the track and ties are removed. The use of steel ties gives several inches of much desired

headroom and both the ties and track are more easily removed. When this has been done, the work of pulling the props between the cribs and the roomnecks is begun.

Should it happen that the rock fails to fall when this method is tried in the first room, a row of shotholes must be drilled along each rib. A pillar of solid coal 100 ft. wide separates the first room from the main headings for their protection. A good fall should be made in the first room, before the same is attempted in the room next adjoining. Experience will be a guide to future procedure.

BUGGY USED TO LOAD OUT TOP COAL

After getting a good fall, the crosscuts are choked up to the cribs and it is now necessary to drive two chutes, one in each roomneck, up to the top coal, as shown in Fig. 3, which illustrates the condition after

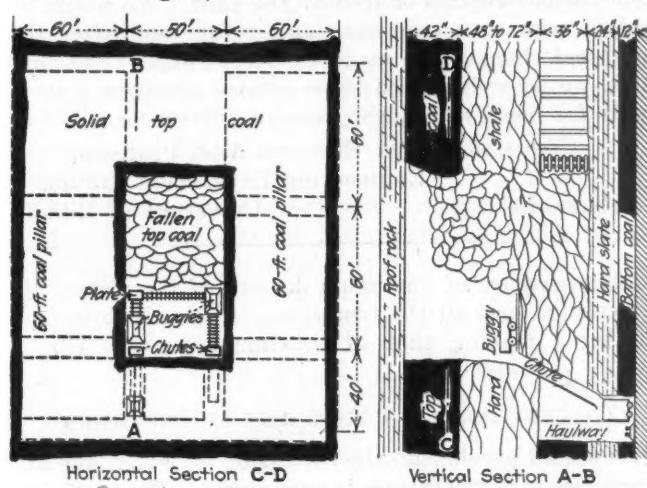


FIG. 3—PLAN AND ELEVATION WORKING OUT TOP COAL

the first fall has taken place as far back as the cribs. A low buggy is used for loading out this coal, the buggy being dumped over a small cradle dump arranged at the top of each chute. The coal falls directly into the mine car standing under the chute. If desired, a door can be arranged to control the descent of the coal, as in a regular loading chute.

Light-weight track is laid from the cradle-dump and sheetiron plates are used to turn the buggies along the face in loading out the top coal. These plates are easily moved forward when necessary. As the work advances, cribs are built to support the roof and protect the track, which must be used to bring back the top-coal pillars.

IDEAL METHOD FOR RETREATING PLAN

The falls in the second and succeeding rooms are produced in the same manner as just described, using the crosscuts as escapeways, in case a hasty retreat becomes necessary. When the cross-entries have reached their distance, the entry pillars are pulled by driving 20-ft. rooms through the center of each pillar, thereby leaving 20-ft. pillars on either side. These pillars are pulled from the inby end to the next outby crosscut, allowing the overhead parting rock and top coal to fall. This top coal is then loaded from the two adjoining rooms, using the track nearest to the pillar and dumping the coal through the chutes.

To my mind, this is an ideal system for driving the entries to their destination or boundary, before working the rooms. If that is done, both the wide and the

narrow rooms can be worked at the same time, starting from the inby end. As soon as the last of the top coal is loaded out of the rooms, the narrow room can be ready for its first fall. The top coal may then be loaded continuously, until both the room and the pillar are loaded out. Moreover, there will be less danger from the cribs in the top seam rotting away while waiting for the pillars to be pulled back, and there will be no danger from creep.

In the use of this method, it is quite evident that there is very little shooting required to mine the top coal, whether it falls with the parting or holds fast to the roof. As a result, a maximum of lump coal will be produced and a good output obtained, per man, per day. There is not as much danger in pulling the props as would seem.

For two years, I was foreman at a mine working two seams of coal separated by from 12 to 36 in. of slate. The bottom seam ran from 3 ft. to 6 ft. in thickness, while the top seam averaged 3 ft. The coal was overlaid with stratified sandrock. We employed the system just described and I never knew a man to meet with an accident in pulling the props for a fall. Any of the experienced men would "throw in" a room 20 ft. wide, for a distance of from 75 to 100 ft., for \$3. This was in 1917.

JOHN WALLS, SR.

Bayview, Ensley, Ala.

Resistance to Flow of Air Offered by Obstructions in Airway

Investigation underway to determine amount of resistance offered by different forms of obstruction—Important to provide for stream-line movement of air current.

IT WAS with much pleasure that I noticed the reference to "Reducing Resistance to Flow of Air in Fan-shaft," which appeared in *Coal Age*, Oct. 11, p. 561. The inquirer desired information in regard to the benefit to be derived by rounding the bottom of the fan shaft so as to avoid abutting surfaces for the air current to strike against.

It was also stated that 40-lb. steel rails had been placed across the shaft to resist the pressure due to a quicksand formation a few feet below the surface. The question was asked to what extent these rails would obstruct the flow of the air in the shaft.

Inasmuch as the investigations in my charge at the present time have for their object the determination of the resistance offered by different forms of obstruction to the flow of air in airways, I was deeply interested in reading the reply of the editor to this inquiry.

INVESTIGATIONS TO DETERMINE THE RESISTANCE OFFERED BY TURN IN AIRWAY

In general, the resistance offered by a right angle turn in an airway, such as is met at the foot of a shaft, has been found to cause a theoretical loss of pressure equal to twice the velocity head of the current, as the editor has stated in reference to the effect that may be expected to result from rounding the bottom of the shaft. This was one of the first results shown in our investigations, which are just beginning to get underway. Later, we expect to be able to specifically evaluate the various forms of obstructions commonly found in airways.

Regarding the resistance offered by the steel rails

described as placed across the shaft, it is quite probable that their effect is greater than may be generally supposed. While we are unable, at this time, to present any precise numerical data on this form of obstruction, it can be said that some work which has been done indicates that the loss of pressure due to the air current striking such an obstruction at a high velocity is considerable, I may even say surprisingly large.

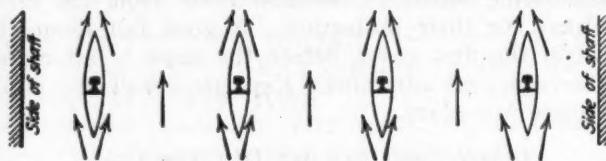
STREAM-LINE CURRENT REDUCES RESISTANCE

In my opinion, such losses may be cut down to one-half or even one-fourth by giving the crossbeams a fish shape that will divide the air current and cause it to follow stream lines, instead of creating an eddy just beyond the obstruction. Let me suggest, therefore, that much benefit would be derived, in this case, by building up a shell about the rails placed in the shaft, so as to give them a stream line effect.

Using light sheet metal, a good mechanic can do this at a comparatively small cost. Or, possibly, the rails can be encased in concrete so as to present the same stream-line shape to the air current. The exact position of these rails in the shaft is not given in the inquiry further than to say that they are placed across the shaft. I have shown, in the accompanying sketch, how these

may be encased in sheet metal, or concrete, to produce the desired effect and very much reduce their resistance to the flow of the air.

In view of the investigations in progress along this line, it might be a benefit both to the operator and to ourselves engaged in the work, if arrangements could



CREATING STREAM LINES PAST OBSTRUCTING RAILS

be made to take some readings in this shaft, for the purpose of determining the pressure losses resulting from the obstruction offered by the rails. We would be glad to take such readings, both before and after the suggested changes are made, if that is done. For that work, we have developed some precise sensitive instruments for measuring such pressure differences.

THOMAS FRASER, Research Asst. Professor,
Engineering Experiment Station,
Urbana, Ill.
University of Illinois.

Inquiries Of General Interest

Weight and Expansion of Water, Formulas for Calculating

*Temperature of Water at Maximum Density—
Coefficient Shows Expansion Is Then Zero—
Maximum Density Basis of Calculation*

KINDLY give the weight of a gallon of pure water and state whether this weight per gallon is the same for all temperatures. If not, how can the weight be estimated for any given temperature?

Denver, Colo.

STUDENT.

For ordinary calculations, the weight of pure water is commonly taken as 62.5 lb. per cu.ft., or $62.5 \times 231/1,728 =$ say $8\frac{1}{2}$ lb. per gal., making 12 gallons per hundred pounds of water. For closer calculation, however, the weight of pure water, at maximum density (39.2 deg. F.), is 62.4283 lb. per cu.ft., or 8.345 lb. per gal.

Owing to a very slight expansion of the water by heat, its density and weight, per unit volume, is slightly less at the higher temperatures. In order to calculate the weight of any given volume of water at a given temperature, it is necessary to multiply the weight of the water at maximum density, by its density at the given temperature. For example, the density, (D) of pure water, at any temperature (T , absolute), is given very approximately by the formula,

$$D = \frac{1,000 T}{500^{\circ} + T^{\circ}}$$

This formula is based on a density of unity, or 1, at

the temperature of maximum density of the water. In the calculations, all the temperatures are absolute temperatures making that of maximum density $460 + 39.2 =$ say 500.

CALCULATING THE COEFFICIENT OF EXPANSION

As stated previously, the expansion of water, for any given rise in temperature, is very slight. The coefficient of expansion for any given temperature, may be calculated thus: Since the formula just given expresses the density of pure water at an absolute temperature T , its volume per pound at such temperature, is the reciprocal of that formula, which gives

$$\text{Vol. per lb.} = \frac{500^{\circ} + T^{\circ}}{1,000 T}$$

Then, taking the volume at maximum density as unity, or 1, the increase in volume, at any temperature T , absolute, is

$$\frac{500^{\circ} + T^{\circ}}{1,000 T} - 1 = \frac{500^{\circ} + T^{\circ} - 1,000 T}{1,000 T} = \frac{(T - 500)^{\circ}}{1,000 T}$$

The original volume at maximum density being 1, this increase in volume, at any temperature T , gives the ratio of expansion for such rise in temperature. Finally, dividing again by the temperature, absolute, gives for the average expansion per degree, or approximate coefficient of expansion.

$$\text{Coef. of expansion} = \frac{(T - 500)^{\circ}}{1,000 T^{\circ}}$$

Notice that the expansion at maximum density becomes zero, since then $T = 500$. By way of illustration, let it be required to find the volume of 1,000 cu.ft. of pure water at a temperature of, say 240 deg. F. ($460 + 240 = 700$ deg. abs.). The coefficient of expansion of the water at the given temperature being

$$\text{Coef. of expansion} = \frac{(700 - 500)^{\circ}}{1,000 \times 700^{\circ}} = 0.00008$$

which makes the increase in this volume $1,000 \times 0.00008 = 0.08$ cu.ft., which is so slight as to be practically inappreciable.

Examination Questions Answered

Anthracite Foremen's Examination, Districts 15 and 16, 1923

(Selected Questions)

QUESTION—*Why is it that firedamp may be found and ignited near the roof of a mine when there is none near the bottom; and why does blackdamp seek the lower level?*

ANSWER—Firedamp is an explosive or an inflammable mixture of methane (marsh gas) and air. The specific gravity of methane is 0.559, showing it to be little more than half again as heavy as air. On this account, the firedamp mixture is always lighter than air and has a tendency to accumulate at the roof and at other high points in the mine.

On the other hand, blackdamp is a mixture of carbon dioxide and air. The specific gravity of carbon dioxide is 1.529, showing blackdamp to be more than half again as heavy as air. On this account, a blackdamp mixture tends to accumulate at the floor or in other low places in the mine.

QUESTION—*If two breasts are being driven toward each other what precaution would you take to prevent accidents from blasting?*

ANSWER—The utmost care must be taken, in such cases, to give ample warning before proceeding to fire a shot in either place. One must be sure that the warning is understood by the response given to the signals indicating that a shot is about to be fired. When the breasts have approached each other closely and but a few feet of barrier coal remains the safest plan is to stop the men working in one of the places till the shots have holed through.

QUESTION—*If you were acting as assistant mine foreman, where would you consider the proper place to leave your ordinary mine lamp when making the early examination of the section of the mine you have in charge?*

ANSWER—When making his early examination in the morning a fireboss should never carry an open light into the section of the mine in his charge. He should have with him none but an approved safety lamp that has been duly examined, cleaned and assembled, except he may carry an electric cap lamp to give him the best possible light in examining the roof, coal and timbers at the working faces. If an open light is taken at all into the mine it should be left on the shaft bottom.

QUESTION—*Why is the ignition of a small body of firedamp more dangerous in a thin seam of coal than in a thick seam? State fully.*

ANSWER—When a body of gas is ignited in a thin seam or contracted openings the expansion of the hot gases causes the flame to practically fill the opening and there is little escape for the men who may be present. On the other hand, in a thicker seam where there is ample headroom, the flame of the igniting gas will often travel along the roof, thereby affording greater opportunity for the men to escape.

QUESTION—*How would you proceed to remove a body*

of firedamp from a series of breasts, pitching 30 deg., the gas having accumulated during the stopping of the fan?

ANSWER—Before making any attempt to remove or disturb the gas, notify and withdraw all the men working in that section or exposed to the return current in its passage out of the mine. Then, starting at the outby end on the intake side of the section, deflect all the air toward the face of the first place, by erecting a brattice or hanging a canvas for that purpose in the entry. Allow none but experienced men to assist in the work and use none but approved safety lamps that have been carefully examined and assembled.

Proceed slowly, allowing plenty of time for the air to sweep away the gases accumulated at the face of the pitch, in the first chamber. Make frequent tests with a safety lamp to ascertain the progress of the work. When the first chamber is clear of gas, carry the brattice through the last crosscut and extend it so as to sweep the gas from that place. In like manner, continue to clear each place of gas throughout the section. The entire section must then be carefully examined and reported safe before men are permitted to enter again for work.

QUESTION—*What care and attention should safety lamps receive if used in a mine giving off considerable gas? Who does the law require to furnish and care for the safety lamps?*

ANSWER—The Anthracite Mining Law, Art. 12, Rule 9, requires the employment of a competent person charged with the duty of examining every safety lamp immediately before it is taken into the workings for use. All lamps must be clean, safe and securely locked before being given to the men, except when the mine foreman permits a lamp to be used unlocked, which he is authorized to do. The same section provides that the lamps shall be the property of the owner of the mine.

QUESTION—*Explain the difference between natural and mechanical ventilation and state which, in your opinion, is the most dependable, giving your reasons in full.*

ANSWER—Natural ventilation depends on the circulation of air through the operation of a natural agency, such as the natural heat of the mine; the force of surface winds acting on the mine opening; or the action of water falling in a shaft. The natural heat of the mine forms an air column in a shaft or a slope mine and in rise and dip workings. The resulting pressure is determined by the difference in temperature of the inside and outside air and height of the air column.

On the other hand, mechanical ventilation is that produced by mechanical means, as the action of a fan, steam jet or blower. Mechanical ventilation is more dependable than any form of natural ventilation, being under better control and capable of being increased according to requirements.

QUESTION—*Why is the ventilation of a mine necessary? Describe fully.*

ANSWER—Ventilation is necessary in order to remove all noxious gas generated in a mine and supply in its place fresh air that will support life and make the mine safe for work. The air current entering the mine dilutes and renders harmless the inflammable and poisonous gases that may be produced and which render the mine unsafe for work. When properly conducted the force of the air current sweeps these gases from their lodgments and carries them out of the mine.

High Spots in U. S. Coal Commission's Report On Bituminous Miners and Their Homes

The Coal Commission made a study of original census returns for 1920. It found:

Soft-coal mine workers numbered 584,985 and 147,456 were anthracite workers.

Twenty-one per cent of soft-coal workers live in towns of 2,500 or more, 79 per cent live in the country.

Nearly 60 per cent are native-born white, 8.1 are native colored, and 32.7 were born outside the United States.

Sixty-nine per cent of the foreign-born bituminous-mine workers have been in this country 10 years or more; of anthracite workers 78 per cent.

Eighty-eight per cent of soft-coal workers are able to read and write.

Over 62 per cent maintain homes where they work, and over 95 per cent of these are or have been married men.

Nearly 11 per cent of the soft-coal mine workers are sons of mine workers.

Approximately half the soft-coal mine workers live in company owned houses.

The report lists 66 "best" company controlled mining towns out of 713 examined, and 82 "worst."

This report represents "three distinct but related field investigations and a tabulation of census data hitherto unutilized." Field agents made surveys of 880 communities—713 controlled by companies, 167 independents—for data on physical environment and community resources; sanitary surveys were made for the Commission by the U. S. Public Health Service in 123 communities, 64 company controlled and 59 independent, and retail prices, rental rates, etc., were studied in selected districts and family budgets collected for information about the cost of living.

Pinchot Inspection Plan Maintains Quality of Anthracite

The State Department of Mines of Pennsylvania has received the first reports of the inspection made by order of Governor Pinchot to ascertain what quality of coal is being furnished the public by the anthracite producers. These show that stone and bone were found in a number of cars of domestic sizes of coal, and that the coal was below the required standard. The coal was condemned.

A statement issued by the department reads:

"An important part in Governor Pinchot's plan to correct the abuses in the anthracite industry of Pennsylvania is the improvement in the quality of coal furnished to consumers. This is one of the most deplorable phases of the situation, as coal of inferior quality means a decided increase in the actual cost to the consumer. Among the reputable operators there is a standard of quality and when it is adhered to no complaint is made regarding the quality of the coal. This standard, roughly speaking, allows the following percentages of unburnable matter: In broken or grate coal, 1 per cent slate and 1 per cent bone; egg, 2 per cent slate, 2 per cent bone; stove, 4 per cent slate, 3 per cent bone; chestnut, 6 per cent slate, 5 per cent bone, and in the very small steam sizes from 10 to 20 per cent slate and bone.

"To get first-hand information on this subject and to accomplish immediate results for the benefit of the public the Governor directed Secretary Walsh, of the Department of Mines, to take charge of the matter. Secretary Walsh last week issued instructions to the state mine inspectors in the anthracite region to go to the mines and inspect the coal that was loaded for shipment to market. Reports have not yet been received from all of the inspectors, but those that have been received show the wisdom of the course being pursued to obtain clean coal, and the effect upon future shipments no doubt will be such as to guarantee a very much better grade of coal in many instances than has been furnished in the past."

Mining Institute Nominates Officers

William Kelly, of Vulcan, Mich., mining engineer and industrialist, has been nominated as president of the American Institute of Mining and Metallurgical Engineers for 1924. As vice-presidents and directors, Everett L. DeGolyer, geologist, of New York City, and Charles W. Merrill, metallurgist, of San Francisco, were named. Directors were selected as follows: R. V. Norris, engineer, of Wilkes-Barre, Pa.; George Otis Smith, of Washington, director of

the U. S. Geological Survey; P. B. Butler, mine operator, of Joplin, Mo.; B. D. Quarrie, steel manager, of Cleveland, Ohio, and L. D. Ricketts, engineer, of Warren, Ariz. The nominating committee was composed of Raymond Guyer, chairman; Stuart Crossdale, L. H. Duschak, Carle R. Hayward, Sidney J. Jennings, Birch O. Mahaffey and Dwight E. Woodbridge.

The annual meeting of the Institute will be held in New York City Feb. 18, 19, 20 and 21.

Keeney Proposes Unionizing West Virginia

That the United Mine Workers of West Virginia propose to organize all the miners in the state if possible, is the gist of a statement just made by C. F. Keeney, president of district 17, United Mine Workers, under whose jurisdiction comes all the organized miners of the state at the present time. Coupled with the statement is a general invitation extended to the unorganized coal miners to become identified with the union.

The district president in issuing the invitation declares that "all lawful assistance and moral support" will be extended those desiring to accept the union invitation. He states that the international organization and all its financial resources are back of the campaign to organize non-union fields. Not only is the announcement of the president of district 17 considered significant coming as it does on the heels of the meeting of the policy committee of the union at Cincinnati, but the statement made by Keeney even hints that the announcement is a result of the Indianapolis policy meeting.

2 Dead, 13 Injured in Orient Mine Blast

Two miners were killed and thirteen injured in an explosion in the No. 1 mine of the Chicago, Wilmington & Franklin Coal Co., at Orient, Ill., on the morning of Nov. 26, according to a press dispatch. Six of the injured, it is said, are likely to die. Thirty-five men were working in the section affected by the blast, all of whom had been brought to the surface by the rescue teams at 1 p.m. The big mine employs more than 1,000 men, 922 of whom were in the mine when the explosion occurred. A greater disaster probably was averted by the company's disposition of air currents, which confined the effects of the blast to a small area.

WASHINGTON, Nov. 25.—A pure-coal bill, to follow as nearly as possible the form of the pure-food law, is to be introduced by Senator Borah on the convening of Congress.

Urges Regulation of Anthracite From Mine to Retailer

Governors Asked to Make Concerted Move to Insure Public "Honest Coal at Decent Price"

Governor Pinchot of Pennsylvania opened his anthracite conference in Harrisburg on Monday, Nov. 26, with an appeal to the governors and their representatives from anthracite-consuming states to join with him in a concerted effort to put the anthracite industry from mine to retailer under state and federal regulation.

"The anthracite-using people of America are justly entitled to three things. The first is coal. The second is honest coal. The third is honest coal at a decent price." With these words the Governor opened his address. He said that the settlement of the recent strike provided coal but it could not assure relief from impure coal, nor could it assure freedom from extortionate prices. He said that no other question holds the attention of the people like this question of "honest coal at a decent price and that upon no other question will consumers of anthracite demand such an accounting from executive and legislative authority," adding, "there is no more certain way of incurring their resentment than by failing to take the necessary steps."

There is a tendency, the Governor said, among conservative business men and conservative journals "to consider the government's taking over the anthracite mines, if justice can be had no other way. The public feeling is so deep," he said, "because the people know the anthracite business is a monopoly—greedy, relentless, defiant." Anthracite is a necessity in the control of a monopoly and therefore the anthracite industry is affected with a public interest, and, being a monopoly affected with a public interest, "according to the Supreme Court, is a proper subject for government control."

SAYS OPERATORS TOOK UNFAIR ADVANTAGE

Charging that the settlement of the strike put the wages of the miners only where they should be, increasing production cost 60c. per ton, the Governor charged that the operators "not only passed the whole increase over to the public, which was thoroughly unjust, but took advantage of the situation to make their own profit greater than before." He reiterated his opinion, expressed at Philadelphia two weeks ago, that the whole combination is a "hard-boiled monopoly whose prime interest in the public is that it shall consume their coal at their price."

He stated that the first thing to do is for the state executives to use the power they now have, as by publicity as to fraudulent practices. State officials also can "ascertain and tell the people what extortions are being practiced, and by whom." Discussing Pennsylvania's share, the Governor said that he had already vigorously attacked the problem of rock and dirt in anthracite and is making public the names of operators who are guilty. Royalties, he said, are matters of private contract and cannot be changed. He defended the certification of miners and said that "nothing could be more foolish than to open the anthracite mines to unskilled mining." The certification law is a just and proper one, he said; "It should not be repealed."

The Pennsylvania anthracite tax has no effect on the price of coal, and Governor Pinchot stated that he was emphatically against its repeal.

Federal action was urged because nine-tenths of the anthracite moves in interstate traffic. Standards for clean coal and for sizes in interstate commerce in anthracite, licenses for all who engage in the trade and authority for denial of railroad cars were three things, together with publicity of accounts, that Governor Pinchot recommended particularly.

Whatever doubt there may be as to the right of the United States "to fix prices, establish uniform accounts, examine books, or require reports in the anthracite industry," Governor Pinchot pointed out that each state can do all of these things if it chooses. He suggested that the

"treaty or compact between the states authorized by the federal Constitution" be seized upon by the anthracite-consuming states as authority under which to set up a joint commission and agree upon a form of regulation of the anthracite industry.

He called for a committee of the governors to prepare a draft for federal legislation and to draft a form of compact to utilize state powers, "with a view to immediate action."

Anthracite Margins Continue to Shrink, Says Federal Trade Commission

Margins taken by anthracite wholesalers have steadily declined since the anthracite strike in September, the Federal Trade Commission reported Nov. 26. There also has been a sharp decrease in the proportion of sales at premium prices. Heavy production at the mines, the commission said, probably is chiefly responsible for the falling off in such sales, but the publication of facts concerning profits and prices has also helped to "bring about a return to normal."

In the first week after the strike the commission found as much as 66 per cent of the coal handled by wholesalers had a profit margin of more than 50c. a ton put upon it. In the week of Nov. 13, the last for which figures were assembled, about 34 per cent was sold at a 50c. wholesale margin.

During the two weeks ending Sept. 22 as much as 30 per cent of the coal traded through wholesalers' hands had cost more than \$12 a ton at the mines. During a like period ending Nov. 3, only 18 per cent of the coal traced had been sold at so high a price.

The commission said that all during the period of investigation "the railroad" anthracite producers, which control most of the tonnage, had sold their output at from \$8.75 to \$9.25 a ton at the mines.

"For the two weeks ending Nov. 3, as compared with the two preceding weeks," says the commission's latest report, "there was no change in the proportion of domestic sizes of anthracite passing through the hands of two or more wholesalers. During the six weeks ending Nov. 3, approximately 25 per cent of all sales reported passed through the hands of two or more wholesalers. For premium domestic sizes reported by wholesalers for the two weeks ending Nov. 3, 74 per cent passed through the hands of but one wholesaler; 25 per cent passed through the hands of at least two wholesalers, and only 1 per cent passed through the hands of at least three wholesalers. For steam sizes the percentages are quite different; 42 per cent passed through the hands of one wholesaler; 57 per cent passed through the hands of at least three wholesalers."

Jackson-Walker and Midland Coal Cos. Merge; Each Retains Old Name

A merger of the Jackson-Walker Coal & Mining Co. and the Midland Coal Co. was announced in Kansas City, Nov. 20. The merger was effected by an exchange of stock by C. P. A. Clough, principal owner and president of the Jackson-Walker company, and C. H. Markham and H. G. Kellogg, owners of the Midland. The two firms will retain their individual names, but will occupy joint offices, probably those of the Jackson-Walker company, in Kansas City.

The Jackson-Walker company has a large acreage of coal land under lease in the southeastern Kansas field. A part of this the company itself is working, while much of it is being worked by smaller individual operators under sublease. The Midland company has a well-organized distribution system, and will operate as a distributing medium for the products of the Jackson-Walker mines, Mr. Clough said.

The merged companies have a capitalization of \$505,000, with a surplus of approximately \$600,000.

Mr. Clough obtained control of the Jackson-Walker company a few months ago by purchasing the stock holdings of the widows of the founders of the company.

Midwest Mines Get Little Running Time

Many Operations in Illinois and Indiana Closed for Several Months—Few Are Working More Than Two or Three Days a Week

The effect of low market on coal production in Illinois and Indiana can be seen plainly in the fact that about 70 mines in Illinois and 85 in Indiana are closed down and many have been down for several months. Few of those in operation have been able to get more than three days running time each week all summer and autumn. The average in both states is now a little less than 40 per cent of full running time for those mines that have avoided shutting down.

The 85 Indiana shutdowns were from a total of 204 mines that were in operation Jan. 1, 1923. These closed mines had a daily capacity of 62,561 tons. They constituted 41.6 per cent of the mines in operation in the state last January and the loss of their tonnage amounts to 33.2 per cent of the total capacity of all the mines—183,233 tons daily.

Sixteen of the Indiana mines were abandoned and scrapped because their territory was practically worked out, according to figures and reports filed with the Indiana Coal Trade Bureau, of which Jonas Waffle is manager. Of the 69 which have closed indefinitely, the reason in nearly every instance was, inability to operate at a profit.

It is said that the growing use of coke and the buying by large consumers of the products of the non-union mines of West Virginia and Kentucky are two main reasons for the falling off in demand for Indiana coal.

Another feature of the industry in Indiana is the discrimination in freight rates, Mr. Waffle pointed out. Operators from neighboring states at the present time can ship coal into Indiana at a lower freight cost than the Indiana operators can ship their coal within their own state. John Hessler, president of District No. 11, U. M. W. of A., says he believes this has had quite a good deal to do with the idleness of many of the mines.

Three Big Days with Coal Mine Institute

With the Question Box to the fore, as usual, the Coal Mining Institute of America will open its annual session at the Chamber of Commerce Auditorium, Pittsburgh, Pa., Dec. 19 and 20, and on Dec. 21 will close its session with a trip to the experimental mine at Bruceton, Pa., where the U. S. Bureau of Mines will stage an explosion and show the assembled members the rock-dust barriers, the explosives-testing apparatus and safety-lamp tests.

On Wednesday, Dec. 19, the morning will be devoted to reports of the Executive Board, an announcement of the elected officials, the election of tellers for 1924, an address by the president, Richard Maize, and one by Dr. George H. Ashley entitled "A Practical Classification for the World's Coals." In the afternoon a motion picture entitled the "Story of Dynamite" will be shown, Dr. R. R. Sayers will deliver an address on "Health Hazards in Coal Mining" and John T. Ryan one entitled "Some Observations on European Coal-Mining Conditions."

Three questions also will be discussed: "Does dynamite exert a greater force downward or does it exert the same force equally in all directions?" "What type of safety lamp is the more sensitive to gas—the flat or the round wick?" and "Is radio proving of any practical use in coal mining or for mine-rescue work?"

In the evening a dinner will be given at McCreery's Store with Richard Maize as toastmaster, and Dr. Daniel L. Marsh, pastor of the Methodist Episcopal Smithfield St. Church, "Old Brimstone Corner," as principal speaker. He is the author of "The Challenge of Pittsburgh." Captain Irving O'Hay, "The Soldier of Fortune" and a veteran of eight wars and also author of "From Dan to Beersheba," will come from New York City to address the banqueters, as also the Hon. Abe Potash, a coal operator of New Brunswick, N. J. The new president's address will complete the proceedings.

W. E. Fohl will lead Thursday morning's session, which will discuss three questions, the first being "what precau-

tions should be taken in installing an electrically driven exhaust fan at a gaseous mine to prevent the motor from igniting the gas in the return air when the ventilation is re-established, the fan having stopped long enough to allow the mine to fill with gas? Denver wants the answer. Cleveland, Ohio, will ask "What is the practical limit to the splitting of air currents?" and Altoona is pressing for a reply to the question "What changes in roof, bottom and coal are found when approaching a fault?"

Joseph J. Walsh, State Secretary of Mines, of Pennsylvania, will deliver an address on "Mine Fires and Some Methods for Extinguishing Them."

In the afternoon Thomas Chester will read his paper on "New Data Concerning the Humidification of Mine Air" and Nicholas Evans will preside over a discussion of four questions: "Where does the most dangerous dust lie—on floor, ribs or timbers?" "Is it possible to have an explosion in a mine where your safety lamp gives no indication of firedamp?" "What are the most common causes of the ignition of gas in coal mines?" and "How tight should posts be set in rooms and entries?"

Power and Mechanical Engineers' Exhibit

The power show to be held at the Grand Central Palace, New York City, Dec. 8, will have a complete showing of the latest devices used in measuring the flow of liquids and gases, as well as apparatus for the generation and utilization of power, including boilers, stokers, superheaters, economizers, transmission equipment, and various other items used in the power house.

The demand for increased economies in the operation of power equipment and power-generating equipment has accelerated the development of measuring devices, without which economy of operation is practically impossible. For these reasons the power-plant man interested in effecting savings will surely find much of interest in this exposition. Engineers coping with fuel problems will be interested in the exhibit of fuel burners such as stokers, pulverized-fuel and fuel-oil burners.

During the week of the exposition the annual meeting of the American Society of Mechanical Engineers will be held in the Engineering Societies Building Dec. 3-6, when topics of interest to fuel producers and consumers will be discussed.

Take Steps to Form Alabama Traffic Bureau

Alabama Mining Institute held its annual meeting at the Roebuck Country Club, Birmingham, Nov. 21 with a large attendance. Reports of officers were made on activities of the institute during the past year. The following new directors were elected to take the places of a similar number whose terms automatically expired with the close of the fiscal year: C. T. Fairbairn, manager of the Republic Iron & Steel Co.; J. B. McClary, president of the Yolande Coal & Coke Co., and S. L. Yerkes, president of the Burnwell Coal Mining Co. Officers for the ensuing year will be elected at a meeting of the directors, consisting of nine members, to be held in December. Steps were taken at the meeting toward the formation of a traffic bureau. The institute was addressed by Harry L. Gandy, secretary of the National Coal Association.

By a standing vote, Institute members announced a renewal of their confidence in the National Coal Association and authorized the appointment of a committee to make an effort for one hundred per cent local membership.

Mine Workers Silent on April 1 Program

Mum was the word among International officers of the United Mine Workers after the executive board meeting in Indianapolis, Ind., ending Nov. 20. Plans were made for the Jan. 22 annual convention of the union in Indianapolis, the call for which issues Dec. 1, but little was said about the probable program for the gathering and, of course, not a word about the probable platform of demands upon which the union expects to meet the operators before the end of the present wage contract, April 1.

Again Rejects Plan to Curb Hard-Coal Prices as Illegal

Warriner Tells Pinchot Proposed Agreement by Operators to Restrict Retailers Offends Criminal Statutes—Counsel Says Scheme Is Subterfuge

Governor Pinchot's proposal that the anthracite operators refuse to sell to retailers who charge more than the retail prices of 1922 "offends the criminal laws of the United States" and the plan cannot be accepted, according to opinion of counsel, S. D. Warriner, chairman of the anthracite operators' general policies committee, wrote the Pennsylvania executive No. 23.

Last week George W. Woodruff, Attorney General of Pennsylvania, rendered an opinion that the operators could agree with one another to control prices for the benefit of the public without infringing on the common law, "although they might be in danger of prosecution under the Sherman law if they agreed to hold prices below a maximum. It is hard to find how they could be attacked unless the federal Department of Justice were hostile to action in favor of the public interest," said the opinion.

WARRINER PRESENTS OPINION OF COUNSEL

Mr. Warriner enclosed an opinion by Walter Gordon Merritt, of New York, which said Governor Pinchot's proposal "involves the commission of criminal acts either directly or by subterfuge and should be declined."

In his letter Mr. Warriner said:

"The enclosed opinion of counsel can leave no reasonable doubt that the only proposal made by you to the anthracite operators, at our recent conferences, offends the criminal laws of the United States. From this follows other conclusions involving the hostile attitude which you have seen fit to take against one of the great industries of our state.

"You assumed to furnish a solution and stated to us that your proposals must be accepted or you would attack the industry. You are now carrying out that threatened attack because of our inability to accept a plan which is both impracticable and unlawful.

"A policy of fixed antagonism on the part of state officials obstructs, rather than promotes, our efforts to meet the problems of the industry and the reasonable expectations of the public.

"Permit me again to express our desire to fully co-operate with the State of Pennsylvania in any lawful and practicable plan."

Mr. Merritt's opinion said in part:

"The Attorney General holds that such a scheme would constitute a crime under the Sherman Anti-Trust law, and with this view I am in entire accord. To evade the application of the Sherman Anti-Trust law, the Governor now urges that the same end, though illegal when accomplished by direct agreement between the operators, can be legally accomplished by independent but uniform agreements between each operator and the Governor.

"The Supreme Court of the United States denounced all such evasions. It ruled in the tobacco case that the Sherman Anti-Trust law "embraced every conceivable act which could possibly come within the spirit or purpose of the prohibitions of the law, without regard to the garb in which such acts were clothed. . . . In view of the general language of the statute and the public policy which it manifested, there was no possibility of frustrating that policy by resorting to any disguise or subterfuge of form, since resort to reason rendered it impossible to escape by any indirection the prohibitions of the statute.

"The Governor cannot legalize such a scheme. The Supreme Court held that President Roosevelt's approval of the acquisition of certain property by the Steel Corporation did not make it legal. The suggestion of the Attorney General that such a benign combination, though illegal, would be free from attack 'unless the federal Department of Justice were hostile to action in favor of the public interest,' ignores the fact that boycotted dealers would demand that

federal authorities perform their sworn duty to enforce the law. The operators cannot afford to place themselves in jeopardy by violating the federal statutes and relying upon the connivance of the federal government for protection."

Illinois Mining Institute Is Told People Should Appreciate Cheapness of Coal

John L. Lewis, International president of the United Mine Workers of America, was principal speaker at a luncheon held by the Illinois Mining Institute at the American Annex Hotel in St. Louis, Mo., Nov. 24. This was one of the largest meetings ever held by the institute, about 250 persons being in attendance.

Mr. Lewis in discussing the differences in living, working and operating conditions between the United States and Great Britain, declared that Americans too often failed to realize that coal was produced and sold for less here than anywhere else in the world, that the British miner produced one ton per day as compared to the four tons which the American mine worker regarded as a proper day's work. The British miner was slow, but the operator did not show any greater speed, his buildings and equipment with a few exceptions not being up to date.

He urged that the evils in the coal industry could best be solved by those who were in it. He declared that Congress could not find a solution and any it might think it found would not remedy the situation and probably would be unconstitutional. He had faith that the operators and mine workers would work out their difficulties in conference.

Herman C. Perry, vice-president of the Fifth and Ninth Districts Coal Operators' Association, the second speaker at the luncheon, said that neither the operator nor the mine worker could be blamed for the excessive development of the coal industry in Illinois. It was caused by the apprehension of a fuel shortage arising from the inability of the carriers to fulfill their duties. Only once, said he, in forty years had there been an actual coal shortage. If the railroads had been able to handle the tonnage when the peak demand came there would never have been any overdevelopment.

Mr. Perry spoke with much favor regarding a bill offered in the last session of the Illinois Legislature which would, in his opinion, have been the biggest step made in recent years in the coal industry. It provided for the retreating system of mining. The bill failed. Had it passed it would have eliminated the small mine and would have given us large mines but fewer of them, thus decreasing the cost of distributing, collecting and hauling railroad coal cars. The mines now in operation in Illinois were, he added, capable of supplying the demands made on the Illinois fields for the next twenty-five years without the opening of another mine. If there were coal equipment available Illinois could produce a million tons a day.

At the technical session, J. A. Ede, consulting mining engineer, of La Salle, Ill., discussed new methods in longwall, arousing some disagreement but on the whole finding a general approval of his advanced opinions. Harvey E. Smith, general superintendent, Leland Coal Co., Springfield, Ill., discussed coal mining in South America.

At the business session, which concluded the meeting, the following were elected: D. D. Wilcox, superintendent Superior Coal Co., Gillespie, Ill., president; Harvey E. Smith, first vice-president; E. G. Lewis, superintendent, Chicago & Sandoval Coal Co., Sandoval, Ill., second vice-president; Martin Bolt, secretary and treasurer (eleventh time); George K. Larrimore, Springfield, Ill.; F. F. Tirre, St. Louis, Mo.; J. A. Jeffries, St. Louis, Mo.; Sam T. Jenkins, St. Louis, Mo., and Bruno Meyers, Staunton, Ill., directors.

ANNOUNCEMENT WAS MADE in Washington last Saturday that the U. S. Attorney for the District of Columbia will ask an indictment of certain Washington retailers on the ground that they have entered into an understanding as to prices. Previous efforts to prove violation of the law by District of Columbia retailers have failed.

Draft Bill for Compulsory Cost Returns to Trade Commission

Blunder Seen in Operators' Failure to Report Voluntarily—C. P. White May Be New Coal Chief of Commerce Department

BY PAUL WOOTON

Washington Correspondent of *Coal Age*

Friends in Congress of the Federal Trade Commission are prepared to insist that there be no repudiation of the commission in the matter of gathering figures on the cost of producing coal. There are a number of national legislators who are expected to insist upon compulsory returns being made to the Federal Trade Commission. Whether the figures are to be submitted voluntarily or on a compulsory basis, the friends of the commission feel that they should go to this agency of the federal government since it was the commission that first embarked on this activity and would be continuing it were it not for the legal technicalities which have been placed in its path by those from whom the returns must come. To allow this function to pass into the hands of the Department of Commerce or any other government agency, in their opinion, would be a sort of repudiation of the commission, or at least it would be failure to uphold its hands.

There are other members of Congress who fear the coal industry would be dealt with too sympathetically were cost figures to be gathered by the Commerce Department. Their idea is that the Federal Trade Commission would come nearer getting the real facts. The experience with the railroads has taught many members of Congress that it is one thing to obtain returns, but quite another to procure figures that tell the real story. There are many who believe most railroads are earning, in effect, more than is indicated by the bare returns to the Interstate Commerce Commission. If either voluntary or compulsory figures are submitted to the Federal Trade Commission, there is a feeling among some members of the national legislature that they would be interpreted not so much as the industry would like but in a way best calculated to serve the public interest.

It is known definitely that a bill has been drafted providing for compulsory returns of cost data to the Federal Trade Commission.

As the situation is shaping itself, the seriousness of the mistake of the operators in not starting the voluntary returns which they promised the Coal Commission is becoming more apparent. Had this plan been put in operation immediately after it was suggested, it is improbable that Congress would have disturbed the arrangement. Since considerable time must elapse from the time legislation is introduced until it is brought up for final consideration, there still is time for the industry if it prefers to co-operate with the Department of Commerce rather than the Federal Trade Commission, to get the plan under headway.

N. C. A. BLAMED FOR CLOUDING SITUATION

The National Coal Association cannot be blamed too severely because of the uncertainty injected into the situation by the fact that Mr. Wadleigh was to leave the department. To reach a thorough understanding of such a plan, many conferences are necessary and much effort must be expended. The operators took the view that it would be better to await the advent of Mr. Wadleigh's successor before attempting to launch their proposal.

As this is written, it seems probable that the new chief of the Commerce Department's Coal Division will be C. P. White. It is known definitely that Mr. White may have the position if he will accept. Mr. White's decision in the matter is expected within the next few days. It is generally admitted that Mr. White is excellently qualified to fill this position. It is well known that he enjoys the confidence of the industry and it is believed that the members of Congress interested in coal will agree that he can be relied upon to be entirely conscientious in the discharge of his duty to the public.

The hope is expressed by persons outside of the coal

industry, who are anxious to see that industry spared the burdens of regulation, that the voluntary returns to the Department of Commerce can be begun prior to the introduction of the bill which would divert the figures to the Federal Trade Commission. If the arrangement starts functioning after that date, there would be ground for the belief that it was contemplated seriously only when the Federal Trade Commission idea was proposed. The chance of preventing the designation of the Federal Trade Commission as the agency to receive coal-cost figures has been reduced by failure to get the plan under way, but it is apparent that even a late start with the Department of Commerce would put the operators in a better position to carry out their desires than would be the case if no start at all were made.

Madeira, Hill & Co. Deny Agreement To Enhance Anthracite Prices

Madeira, Hill & Co., of Philadelphia, anthracite producers, have made a sweeping denial of the charge made by the Federal Trade Commission that the company entered into a secret agreement with certain wholesalers to enhance the price of anthracite beyond that recommended by the Fair Practices Committee of Pennsylvania during the recent strike. Madeira, Hill & Co. was one of six defendants named in a complaint by the commission, the others being wholesalers.

While admitting the Fair Practices Committee had recommended that \$10.50 per ton at the mines for prepared sizes of anthracite would be a fair price, Madeira, Hill & Co. denied it gave any assurance to the committee that it would observe such a price and also denied that it was under any obligation to observe such price.

The total amount of tonnage involved in the sales to the defendant wholesalers amounted to 2,783 tons, it was stated. "Such sales were so trifling in comparison with the total anthracite production that they could not possibly have enhanced or affected the price of coal to the consuming public," the firm's denial said.

Denying the commission has any jurisdiction over the matter of billing any sales made by it, Madeira, Hill & Co. informed the commission "that for some months, prior to the filing of the complaint, all of its sales had been billed, and now are being billed, at the prices at which the coal is sold."

The case will be heard by the Commission on Dec. 3.

The Federal Trade Commission has overstepped its powers in attempting to determine "what is an unfair, unreasonable and unjust margin of profit on anthracite," according to answers filed with the commission Nov. 15 by two of the wholesale coal dealers named in complaints filed by the commission for pyramiding of prices.

If business men generally adhered to the margin of profits determined by the commission they would be driven "into insolvency and trade stagnation," coal dealers declared. The answers were filed by C. P. Brodhead and Lynn M. Ranger, located at Boston; the Titan Fuel Corporation and Pattison & Bowns, Inc., New York City.

The latter company, after admitting the functions of the office of the Federal Fuel Distributor during the national coal emergency, denied any knowledge or information of how many states "by legislative enactment or proclamation co-operated with the federal government in coping with the emergency."

The first-named respondent declared that its information in regard to the appointment of a "Fair Practices Committee by Governor Pinchot of Pennsylvania and a commission appointed by the Federal Fuel Distributor" was received in the newspapers, "but at no time did it receive any communication from these committees to work in conjunction with the Federal Fuel Distributor."

This respondent also questioned the authority of the Fair Practices Committee of Pennsylvania, but after an investigation ascertained it was a voluntary committee, with no authority under the law.

Pattison & Bowns characterized as absurd the charge that they had entered into a conspiracy with Madeira, Hill & Co. to enhance prices.



Production and the Market

Weekly Review

The soft-coal market lacks the usual November snap. Buying of free coals is being done very quietly and cooler weather is needed to bolster up the trade. Current needs are taken care of only when the lowest prices prevail. With the Lake season drawing to a close the mines shipping coal to Lake Erie ports are affected and more closings are reported. This situation has been reflected in the volume of screenings available for spot buyers in the West and has resulted in a stiffening of prices. Smokeless lump suffered a reduction of prices in practically all Western markets, while the steam-coal market showed more strength. The tidewater markets have been strengthened by a practically cleaning up of distress coal.

However, soft coal prices advanced last week to the level attained on Oct. 22, *Coal Age* Index showing 186, an increase of three points from the previous week. The average price was \$2.25. For the corresponding week of 1922 the Index registered 330 with an average price of \$3.99. Increases were recorded in Springfield, Indiana, eastern and western Kentucky, Hocking, Pocahontas, Pittsburgh, Clearfield and Kanawha coals.

INQUIRIES MORE NUMEROUS; ORDERS SCARCE

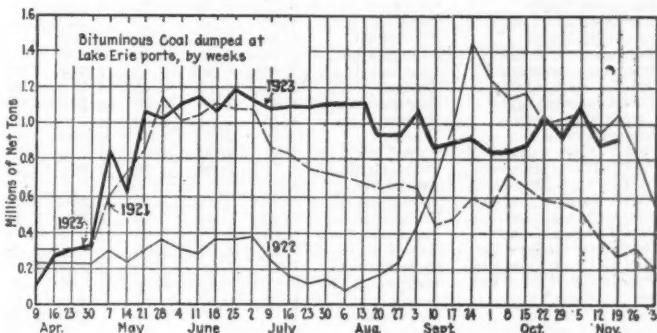
Operators and shippers see a ray of hope in the increased number of inquiries, but new orders are scarce.

Although many mines are closed, production of soft coal during the week ended Nov. 17 is estimated by the Geological Survey to have been 9,684,000 net tons, a decrease of 1,042,000 tons from the previous week, reports indicating that Armistice Day counted only a little more than one-half a normal Monday. Indications point to a production in the neighborhood of 10,500,000 net tons for last week.

There was a marked depression in smokeless coals in the Middle West, but a strengthening in steam coals. Taken altogether the situation is not favorable. Business is practically at a standstill in St. Louis. Similar conditions regarding smokeless coals exist in the Cin-

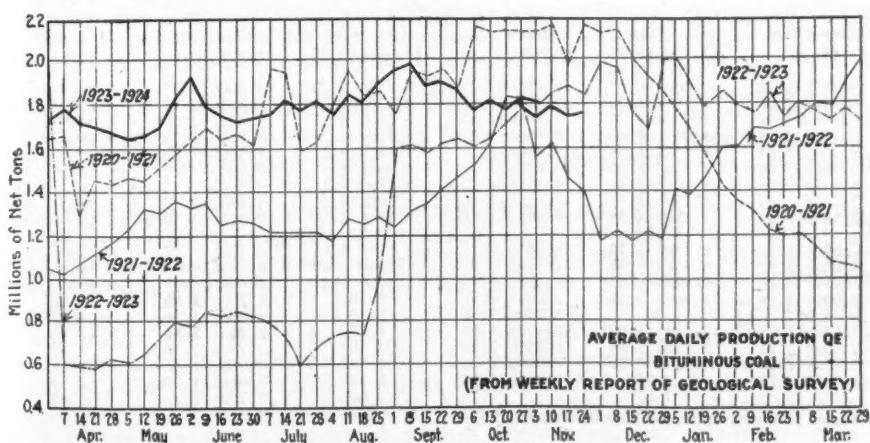
cinnati market. There is a surplus of tonnage available, although many of the mines in southeastern Kentucky are closed. There is little demand and strength in the Columbus market, while at Cleveland business is dull. Production in the Pittsburgh district is being curtailed in keeping with the decrease in Lake shipments, which also has resulted in a slight betterment in slack. There is no improvement reported from New England, but it is noted that distress coal has been cleaned up. A slight encouragement is apparent in the textile field.

Production of anthracite was 1,725,000 net tons in the week of Nov. 17, according to the Geological Sur-



	Week Ended Nov. 19	Season to Nov. 19
Cargo	890,874	28,290,920
Fuel	43,554	1,522,572
Totals	934,428	29,813,492

vey, a decline of 242,000 tons when compared with the previous week, the decrease resulting from Armistice Day idleness. It is estimated that output exceeded 2,000,000 tons last week. Demand for high-priced coals is rapidly disappearing and most shippers believe that it will practically be out of the market before the end of December. Demand centers around stove and



Estimates of Production

(Net Tons)

BITUMINOUS

	1922	1923
Nov. 3	10,666,000	10,547,000
Nov. 10 (a)	10,147,000	10,726,000
Nov. 17 (b)	11,215,000	9,684,000
Daily average	1,869,000	1,761,000
Daily average cal. year	1,263,000	1,795,000

ANTHRACITE

Nov. 3	1,872,000	1,373,000
Nov. 10	1,897,000	1,967,000
Nov. 17	2,230,000	1,725,000
Calendar year	42,653,000	84,356,000

COKE

Nov. 10 (b)	246,000	255,000
Nov. 17 (a)	264,000	246,000
Calendar year	6,313,000	16,427,000

(a) Subject to revision. (b) Revised from last report.

chestnut coals, with egg and pea sizes much more in evidence. Steam sizes move slowly.

The export situation looks brighter. Reports from Great Britain indicate that the effect of American competition in the Mediterranean is being felt. Dumps at Hampton Roads for all accounts during the week ended Nov. 22 amounted to 264,302 net tons, as compared with 290,492 tons in the previous week.

Midwest Steam Coal Firmer

A slight strengthening of steam coals and further depression of Eastern smokeless on the Chicago market were the only notable features of Midwest coal trading during the week. Production has been low for so long that the supply of screenings is small enough to cause a trifling improvement, and this was sufficient to firm up the bottom of the steam market.

Production throughout Illinois and Indiana continues at less than 40 per cent and the market generally is lifeless. There is still a place to put almost all the domestic lump, but no keen demand for it. The recent drop in the prices

of egg and nut sizes in order to relieve the load of "no bills" has had only a little effect. The tremendous production of smokeless in the East has finally mashed down the price of smokeless lump still further. Lump that sold for \$6.25 a few weeks ago is now dragging along on the Chicago market at a bare \$4.50. Smokeless mine-run is hardly able to stay above \$2. The situation generally throughout the Middle West is not cheerful, but cold weather is closer.

St. Louis Trade Is Flat

Warm weather continues in the St. Louis territory and business is at a standstill. The situation is the same in the country as in the city and dealers have their yards full of coal and their equipment idle. Local wagonload steam is quiet. There is no activity in carload steam, either local or in the country, excepting a little moving toward Chicago at prices below cost.

Never in the history of St. Louis have conditions at this particular season of the year been as bad as they now are. In spite of the failure to move coal the low level seems to have been reached. Conditions that are gradually growing worse fail to change prices.

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Market	Nov. 27	Nov. 12	Nov. 19	Nov. 26	Market	Nov. 27	Nov. 12	Nov. 19	Nov. 26		
Quoted	1922	1923	1923	1923†	Quoted	1922	1923	1923	1923†		
Low-Volatile, Eastern					Midwest						
Smokeless lump.....	Columbus....	\$6.75	\$5.10	\$4.85	\$4.00@ \$4.25	Franklin, Ill. lump.....	Chicago....	\$5.00	\$4.10	\$4.10	\$3.90@ \$4.35
Smokeless mine run.....	Columbus....	6.15	2.35	2.15	2.00@ \$2.25	Franklin, Ill. mine run.....	Chicago....	4.10	2.60	2.50	2.25@ \$2.50
Smokeless screenings.....	Columbus....	5.75	1.35	1.30	1.25@ 1.40	Franklin, Ill. screenings.....	Chicago....	2.50	1.45	1.45	1.40@ 1.50
Smokeless lump.....	Chicago....	6.25	5.10	5.10	4.25@ 4.75	Central, Ill. lump.....	Chicago....	4.25	3.10	3.10	3.00@ 3.25
Smokeless mine run.....	Chicago....	5.60	2.25	2.25	2.00@ 2.50	Central, Ill. mine run.....	Chicago....	3.10	2.10	2.10	2.00@ 2.25
Smokeless lump.....	Cincinnati....	6.30	5.50	4.85	4.00@ 4.50	Central, Ill. screenings.....	Chicago....	1.65	1.05	.85	1.00@ 1.10
Smokeless mine run.....	Cincinnati....	6.00	2.35	2.10	1.75@ 2.50	Ind. 4th Vein lump.....	Chicago....	5.10	3.35	3.35	3.25@ 3.50
Smokeless screenings.....	Cincinnati....	5.85	1.50	1.35	1.00@ 2.00	Ind. 4th Vein mine run.....	Chicago....	3.85	2.60	2.60	2.50@ 2.75
*Smokeless mine run.....	Boston....	8.00	4.30	4.40	4.50@ 4.80	Ind. 4th Vein screenings.....	Chicago....	2.05	1.20	1.20	1.25@ 1.50
Clearfield mine run.....	Boston....	3.60	2.15	2.00	1.85@ 2.50	Ind. 5th Vein lump.....	Chicago....	4.75	2.50	2.50	2.25@ 2.75
Cambridge mine run.....	Boston....	4.25	2.55	2.60	2.25@ 3.00	Ind. 5th Vein mine run.....	Chicago....	3.60	2.10	2.10	2.00@ 2.25
Somerset mine run.....	Boston....	3.85	2.35	2.35	2.00@ 2.75	Ind. 5th Vein screenings.....	Chicago....	1.85	.80	.80	.90@ 1.00
Pool I (Navy Standard).....	New York....	5.10	3.00	3.00	2.75@ 3.25	Mt. Olive lump.....	St. Louis....	3.10	3.10	3.10	3.00@ 3.25
Pool I (Navy Standard).....	Philadelphia....	4.75	3.00	3.00	2.80@ 3.20	Mt. Olive mine run.....	St. Louis....	2.25	2.25	2.25	2.20@ 2.30
Pool I (Navy Standard).....	Baltimore....	4.85				Mt. Olive screenings.....	St. Louis....	1.00	1.25	1.25	1.25
Pool 9 (Super. Low Vol.).....	New York....	4.50	2.25	2.25	2.25@ 2.50	Standard lump.....	St. Louis....	4.00	3.05	3.05	2.90@ 3.25
Pool 9 (Super. Low Vol.).....	Philadelphia....	4.50	2.30	2.30	2.20@ 2.45	Standard mine run.....	St. Louis....	2.60	2.05	2.05	1.80@ 2.30
Pool 9 (Super. Low Vol.).....	Baltimore....	4.60	2.05	2.05	2.00@ 2.15	Standard screenings.....	St. Louis....	1.35	.55	.55	.50@ .60
Pool 10 (H.Gr. Low Vol.).....	New York....	3.85	2.00	2.00	1.75@ 2.25	West Ky. lump.....	Louisville....	3.75	3.00	3.00	2.75@ 3.25
Pool 10 (H.Gr. Low Vol.).....	Philadelphia....	3.75	1.85	1.85	1.75@ 2.00	West Ky. mine run.....	Louisville....	2.25	1.65	1.65	1.50@ 2.00
Pool 10 (H.Gr. Low Vol.).....	Baltimore....	3.35	1.90	1.90	1.85@ 2.00	West Ky. screenings.....	Louisville....	1.50	.60	.60	.60@ .75
Pool 11 (Low Vol.).....	New York....	3.25	1.75	1.75	1.40@ 1.75	West Ky. lump.....	Chicago....	4.10	2.85	2.85	2.75@ 3.00
Pool 11 (Low Vol.).....	Philadelphia....	3.15	1.60	1.65	1.65@ 1.75	West Ky. mine run.....	Chicago....	2.60	1.75	1.75	1.50@ 2.00
Pool 11 (Low Vol.).....	Baltimore....	3.10	1.80	1.75	1.70@ 1.85						

Market	Nov. 27	Nov. 12	Nov. 19	Nov. 26	Market	Nov. 27	Nov. 12	Nov. 19	Nov. 26		
Quoted	1922	1923	1923	1923†	Quoted	1922	1923	1923	1923†		
High-Volatile, Eastern					South and Southwest						
Pool 54-64 (Gas and St.).....	New York....	3.50	1.60	1.60	1.50@ 1.75	Big Seam lump.....	Birmingham....	3.95	3.85	3.85	3.75@ 4.00
Pool 54-64 (Gas and St.).....	Philadelphia....	3.50	1.60	1.65	1.60@ 1.75	Big Seam mine run.....	Birmingham....	2.35	1.95	1.95	1.75@ 2.15
Pool 54-64 (Gas and St.).....	Baltimore....	3.30	1.70	1.70	1.70	Big Seam (washed).....	Birmingham....	2.60	2.35	2.35	2.25@ 2.50
Pittsburgh se'd gas.....	Pittsburgh....	4.50	2.55	2.55	2.50@ 2.60	S. E. Ky. lump.....	Chicago....	6.10	3.25	3.25	3.00@ 3.50
Pittsburgh gas mine run.....	Pittsburgh....	2.60	2.25	2.25	2.20@ 2.30	S. E. Ky. mine run.....	Chicago....	4.25	2.25	2.25	1.75@ 2.00
Pittsburgh mine run (St.).....	Pittsburgh....	2.60	1.90	1.90	1.90@ 2.10	S. E. Ky. lump.....	Louisville....	6.50	3.50	3.50	3.25@ 3.75
Pittsburgh slack (Gas).....	Pittsburgh....	3.10	1.05	1.05	1.25	S. E. Ky. mine run.....	Louisville....	3.75	1.85	1.85	1.50@ 2.25
Kanawha lump.....	Columbus....	5.75	3.00	3.00	2.85@ 3.15	S. E. Ky. screenings.....	Louisville....	3.60	.75	.75	.65@ .85
Kanawha mine run.....	Columbus....	3.35	1.85	1.85	1.75@ 2.00	S. E. Ky. lump.....	Cincinnati....	6.35	3.00	3.25	\$.50@ 3.75
Kanawha screenings.....	Columbus....	3.25	.65	.75	.75@ .85	S. E. Ky. mine run.....	Cincinnati....	3.60	1.50	1.50	1.25@ 1.75
W. Va. lump.....	Cincinnati....	6.25	3.10	3.25	2.60@ 3.75	S. E. Ky. screenings.....	Cincinnati....	3.25	.85	.85	.50@ 1.25
W. Va. Gas mine run.....	Cincinnati....	3.60	1.50	1.50	1.25@ 1.75	Kansas lump.....	Kansas City....	5.00	5.10	5.10	5.00@ 5.25
W. Va. Steam mine run.....	Cincinnati....	3.40	1.50	1.50	1.25@ 1.75	Kansas mine run.....	Kansas City....	3.50	3.50	3.50	3.00@ 3.50
W. Va. screenings.....	Cincinnati....	3.25	.80	.85	.50@ 1.25	Kansas screenings.....	Kansas City....	2.50	2.25	2.00	.00
Hocking lump.....	Columbus....	5.05	2.90	2.90	2.85@ 3.10						
Hocking mine run.....	Columbus....	3.25	1.85	1.85	1.75@ 2.00						
Hocking screenings.....	Columbus....	3.00	.70	.90	.75@ .85						
Pitts. No. 8 lump.....	Cleveland....	4.10	2.55	2.55	2.15@ 3.00						
Pitts. No. 8 mine run.....	Cleveland....	3.70	1.90	1.90	1.90@ 2.00						
Pitts. No. 8 screenings.....	Cleveland....	3.20	1.00	1.05	1.10@ 1.25						

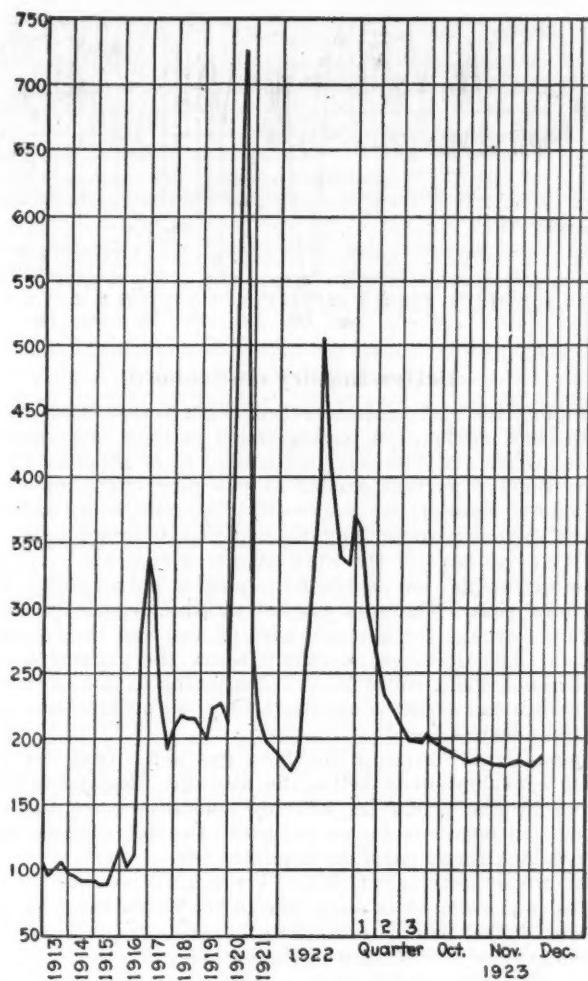
* Gross tons, f.o.b. vessel, Hampton Roads.

† Advances over previous week shown in heavy type, declines in italics.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

Market	Freight Rates	Dec. 26, 1922	Independent Company	Nov. 19, 1923	Independent Company	Nov. 26, 1923	Independent Company
Quoted							
Broken.....	New York....	\$2.34	\$9.00	\$7.75@ \$8.25	\$9.60@ \$10.50	\$8.50@ \$10.00	\$8.00@ \$9.25
Broken.....	Philadelphia....	2.39		7.90@ 8.10			
Egg.....	New York....	2.34	9.25@ 12.00	8.00@ 8.35	9.85@ 12.25	8.75@ 9.25	8.75@ 9.25
Egg.....	Philadelphia....	2.39	9.25@ 11.00	8.10@ 8.35	9.85@ 12.20	8.75@ 9.25	8.75@ 9.25
Stove.....	Chicago*	5.06	12.50@ 13.00	7.20@ 8.25	9.60@ 12.50	8.00@ 8.35	8.00@ 8.35
Stove.....	New York....	2.34	9.25@ 12.00	8.00@ 8.35	9.85@ 12.25	8.75@ 9.25	8.75@ 9.25
Stove.....	Philadelphia....	2.39	9.25@ 11.00	8.15@ 8.35	9.85@ 12.20	8.90@ 9.25	8.90@ 9.25
Stove.....	Chicago*	5.06	12.50@ 13.00	7.35@ 8.25	9.60@ 12.50	8.00@ 8.35	8.00@ 8.35
Chestnut.....	New York....	2.34	9.25@ 12.00	8.00@ 8.35	9.85@ 12.25	8.75@ 9.25	8.75@ 9.25
Chestnut.....	Philadelphia....	2.39	9.25@ 11.00	8.15@ 8.35	9.85@ 12.20	8.90@ 9.25	8.90@ 9.25
Chestnut.....	Chicago*	5.06	12.50@ 13.00	7.35@ 8.35	9.60@ 12.50	8.00@ 8.35	8.00@ 8.35
Range.....	New York....	2.34		8.25		9.00	9.00
Pea.....	New York....	2.22	7.00@ 11.00	6.15@ 6.30	6.50@ 7.75	6.15@ 6.65	6.15@ 6.65
Pea.....	Philadelphia....	2.14	7.00@ 8.00	6.15@ 6.20	6.75@ 9.00	6.35@ 6.60	6.35@ 6.60
Pea.....	Chicago*	4.79	7.00@ 8.00	5.49@ 6.03	6.00@ 6.75	5.40@ 6.05	6.00@ 6.75
Buckwheat No. 1.....	New York....	2.22	4.00@ 5.00	4.00@ 4.10	2.00@ 2.50	3.50	1.75@ 3.50
Buckwheat No. 1.....	Philadelphia....	2.14	5.00	4.00	2.25@ 3.50	3.50	3.50
Rice.....	New York....	2.22	3.00@ 3.25	2.75@ 3.00	1.50@ 2.00	2.50	1.25@ 2.50
Rice.....	Philadelphia....	2.14	2.50@ 2.75	2.75@ 3.00	1.75@ 2.50	2.50	1.75@ 2.50
Barley.....	New York....	2.22	1.75@ 2.00	1.50@ 2.00	1.00@ 1.25	1.50	1.00@ 1.50
Barley.....	Philadelphia....	2.14	1.00@ 1.75	2.00	1.00@ 1.50	1.50	1.00@ 1.50
Birdseye.....	New York....	2.22		2.10		1.60	1.25@ 1.45

* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.



Coal Age Index of Spot Prices Bituminous Coal F.O.B. Mines

Index	1923			1922
	Nov. 26	Nov. 19	Nov. 12	Nov. 27
Weighted average price	186	183	184	330
	\$2.25	\$2.21	\$2.23	\$3.99

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913, 1918," published by the Geological Survey and the War Industries Board.

Southern Illinois mines continue to shut down on account of no market and the entire field has taken on an air of depression that will disappear only after a lot of cold weather arrives. Cars are plentiful and the movement of loads is good, but all mines have plenty of "no bills." There is considerable dissatisfaction at different points among the miners. This condition prevails in every field—Carterville, DuQuoin, Mt. Olive and Standard. Railroad tonnage in all fields is light and not much encouragement is held out for any change for the better until cold weather arrives.

Kentucky Market Dull

In spite of low prices in the western Kentucky field some concerns have been quoting prices at considerably under the market on nut, egg and small lump sizes. Coal is hard to sell at any price just now. Retailers are fairly well stocked. Steam coal is moving sluggishly to industrials and railroads. Many large consumers are well stocked, and buy only on the market dips or when coal is offered at well under the usual market.

Screenings are selling for 60@75c., and while some houses are quoting as high as \$1.25@\$1.35 for 3-in. nut and slack, so-called nut and slack is selling as low as 75@85c. a ton, as a lot of operators cannot find a nut market, and do not figure that it pays to screen it when a ready market

is not available. Mine-run is \$1.50@\$2, good nut \$1.75@\$2.25; egg, \$2.25@\$2.75; and lump \$2.50@\$2.75, while block is quoted at \$2.75@\$3.25. However, there is a good deal of shading being done from these prices.

In eastern Kentucky some non-union mines that are working on the 1917 wage scale and low-cost strippers continue to disturb the market by underselling most producers. Retailers are waiting as usual for a lower market, and may profit by so doing, as prices are working lower on prepared, but at the same time there has been no improvement on screenings.

Northwest Market Still Dull

Little life is noted yet in coal trading throughout the Northwest. Unseasonably warm weather and the long-price cutting battle between lake and rail shippers still combine to produce lethargy. The soft-coal market is about as demoralized as it could be. In most parts screenings continue to sag in price. Other quotations remain steady on circulars but cutting to get business prevails on occasion. The region feels better about hard-coal supplies though popular sizes are still a little short.

Trade at Duluth remains lethargic, with heavy shipments of bituminous coming in and crowding the docks, slight stocks of anthracite on hand, and buyers watching generally for some shifting in the soft-coal market. Hocking screenings have dropped from \$3.75 to \$3.50 and shading is taking place in Youghiogheny and splint coal of the same grade. Other grades are firm at Duluth.

The anthracite situation looks as if it were ready for improvement. In forty-eight cargoes landed last week four were hard coal, and of the twenty-four reported on the way, five are hard. All docks are short of nut size, and stove is not plentiful. Prices remain firm in anthracite with no sign of increasing.

It is estimated that the largest shipments of soft coal will be recorded at Duluth this year for several years past. The total arrivals of soft will come to almost 11,000,000 tons.

The Milwaukee market is quiet. Winter has not yet arrived, consequently the demand is light. The same is true of the back country. Jobbers report everybody well supplied with coal and disinclined to contract for more. Prices hold steady. Lake receipts continue liberal and stocks on hand are increasing daily. November's record thus far is 91,500 tons of anthracite, and 454,361 tons of soft coal, making the season's cargo receipts to date 875,824 tons of the former, and 3,052,062 tons of the latter.

Western Markets Lifeless Too

Coal business generally is low throughout the West with no outstanding improvement anywhere. Running time in the Southwest as well as in Colorado and Utah is low with the trade bemoaning the absence of enough demand to keep mines entirely clear of "no bills." Lump moves with some ease, but slack drags and middle sizes must be forced. Hence there are all sorts of quotations on egg and nut sizes. Circular on those coals mean little.

In Utah lump orders are about all filled and slack is heavy on producers' hands so that the general market comment of sales officials is "Trade is rotten." All sorts of prices on egg and nut sizes are out, varying up to \$1 from day to day, but lump holds fairly firm. A good deal of coal has been shipped on consignment into the Northwestern states and causes the usual demurrage difficulties. It is generally held that the supply of coal in consumers' hands is not large and that a real cold snap will bring a rush of demand.

More Coal Available in Ohio

With the lake trade practically over for the 1923 season more coal is available in the Ohio territory, although production is being reduced because of the lack of demand. Quotations on smokeless lump coal took a sudden drop in the Cincinnati market during the week and large producers were selling as low as \$4.50, although some have refused to cut below the cost of production on mine-run and the higher grades. Retail prices remain stationary.

Buying continues quiet in the Columbus market and is expected to continue so until stimulated by cooler weather. Retail dealers are well stocked and it is said in some instances are cutting prices in order to move their supplies. With large reserves in storage, buying of steam coal is slow, with distress coals showing the only activity. Screenings, which started to show some strength, are easier because of the absence of some of the heavy buyers from the market.

Operators and jobbers in the Cleveland market say it has been a long time since conditions have been so dull. There is no demand for any size of coal. Consumers of all kinds are well stocked. Reports that more mines will close are current, as production is exceeding demand.

There is still a fair movement of lake coal from the Pittsburgh district, although these shipments have been tapering off. Production is being curtailed in order to meet the lowering demand, but it is lessening the volume of slack available. The result has been an advance in quotations for this grade of coal. Cement makers, who use slack exclusively, either steam or gas, bought heavily in anticipation of present conditions at the old market quotations of 85c. to \$1 and are pretty well stocked up. There is no noticeable increase in the line demand for either steam or gas coal.

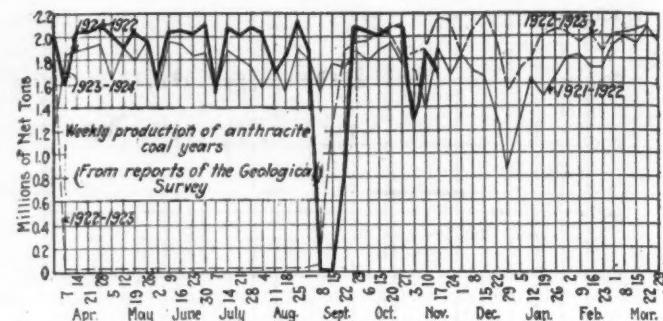
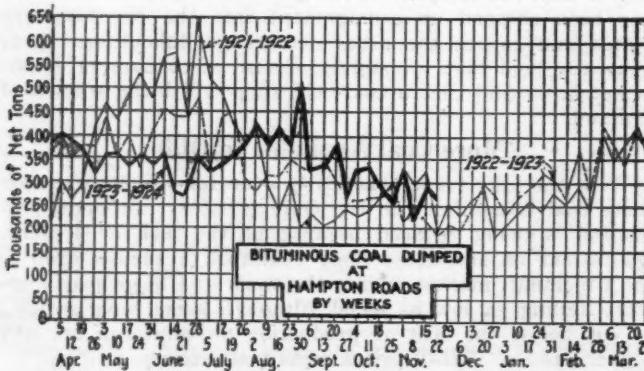
During the week ended Nov. 17 car loadings in central Pennsylvania amounted to 12,900 cars, as compared with 14,177 cars the week previous and with 11,779 cars during the week ended Nov. 3. The decrease in loadings is taken by the operators to indicate increased competition with non-union coal.

New England Shows Little Change

In New England there is little change in the market for steam coal. No improvement in inquiry is yet noticed, although the gradual absorption of distress coal both at Hampton Roads and "down East" has given factors there an opening to quote higher prices to the smaller buyers. Ostensibly the on-car level at Boston has been lifted to \$5.75 @ \$6 for No. 1 Navy Standard Pocahontas and New River, but at the same time there has been quiet selling at 50@75c. less in moderate quantities to make room for cargoes in transit. A very few consumers are making small purchases as weak spots appear, partly on general principles and also to insure against increased requirements between now and spring. Some of the agencies show enough willingness to undertake contracts for January to March periods to discount talk of possible labor troubles later on. In general the spot market is but little improved as compared with a week ago.

F.o.b. Hampton Roads there are also higher quotations than were shown in our previous report; \$4.50@4.80, however, is about the range of actual sales in cargo lots. Demand is no better, but there is less coal on wheels than earlier in the month, and curtailment in the smokeless districts is now the rule.

There is practically no new business in New England for all-rail coal from central Pennsylvania. The high tariff to points east of the Connecticut River precludes competition with Southern coals on the present basis and apparently there is nothing to do but await better things. No better price level is noted on any of the coals normally shipped in this direction all-rail.



Better Inquiry on Seabord

Inquiry for soft coal increased slightly last week in the New York market, but buying failed to show any improvement. With distress coal practically out of the way quotations for the various grades at the piers were somewhat stronger. Receipts were slower, 1,218 cars being reported at the various piers on Nov. 23, while daily dumpings during the first five days of the week averaged 395 cars. There is a better feeling, but increased buying is not expected until the new year. The spot market at Philadelphia continues to hover around the better grades of coal and the consumer finds it difficult to get a supply below the general market quotations. Some consumers are beginning to talk of April 1. The tidewater trade is unsatisfactory, with little coal moving that way.

Demand at Baltimore for both gas and steam coals for home consumption is below the average. Buying is being urged by the producers and low quotations are the rule. Some coal men look for an upturn in December while others do not look for so early an improvement.

In some sections of West Virginia there has been a slight improvement in slack due to the curtailment of shipments to the Lakes, quotations hovering around \$1. Improvement is noticed also in the higher grades of smokeless coals, due to more favorable conditions at tidewater and no accumulations. More mines are closing, but this has not affected production to any great extent.

The Birmingham market is in an unsatisfactory condition, with practically no demand for spot coals. The domestic market is suffering from unseasonable weather conditions and only the best qualities of the suitable coals are moving. Some improvement is reported in the pig iron market, with the prospect of additional furnaces being blown in soon, which will tend to increase coal production by the furnace company mines, many of which are now either idle or working on about half schedule.

Anthracite Market Active

Lack of stove and chestnut creates the real activity in the anthracite market. These two sizes are in constant demand in the seaboard trade, while egg and pea are becoming harder to move. While some houses in the New York market continue to quote as high as \$12.50 for the domestic coals, few if any sales at this figure are reported. Retail dealers in the territory served by local houses are buying comparatively little of the high-priced coals, and in most instances are able to buy at much lower figures if they can use a proportionate share of the steam sizes. In Philadelphia similar conditions exist. Demand is centered on stove and chestnut and there are signs that this situation is righting itself. Indications are that in a few weeks there will be plenty of all sizes of anthracite available to fill all demands.

More seasonable weather conditions are helping the steam-coal situation and there is a slightly better movement, although storing is still necessary to take care of accumulations.

Baltimore dealers continue to complain of lack of receipts sufficient to take care of their customers' wants. There is no emergency, however.

Production of beehive coke during the week ended Nov. 17 was 246,000 net tons, a decrease of 9,000 tons from the previous week, 8,000 tons of which decline is attributed to Pennsylvania and Ohio, according to the Geological Survey.

Foreign Market And Export News

Great Britain's Coal Market Shows Firmer Tone; Production Slightly Reduced

Reduced production of coal by Great Britain's mines has resulted in a firmer tone to the market and a slight advance in prices. Output during the week ended Nov. 10 was 5,572,000 tons or 23,000 tons less than the previous week. Production during the corresponding week of 1922 was 5,440,500 tons.

The somewhat steadier tone of the Welsh market has been considerably upset by the severe gales which delayed shipping and resulted in empty berths.

France is buying on a better basis, orders are more free from Germany, and business is better with Holland and Belgium. The Italian trade is slow.

Considerable interest is shown in contract sales for 1924. Approximately 200,000 tons of coal and coke are reported sold to Germany for delivery over the next six months. One effect of the shortage of ready steamers is that freights have a stiffening tendency, and exporters delay chartering as long as possible in the hope that there will be a fall in the current market.

The Newcastle market is strong but is hampered by delays to shipping through gales. Best steam is oversold and there will be none available till January. Germany is inquiring for steams for the State Railways. The pressure of American competition in the Mediterranean is being felt. There is not much contract business.

French Miners' Wages Increased

Agreements have been made between French mine owners and miners whereby the workers in the North and Pas-de-Calais Basins receive increases in wages during the period from Nov. 1 to the end of February. The new schedules provide that under-ground men shall receive increases ranging from 2.75 to 3 fr.; younger crews, 1.25 to 1.75 fr.; surface men, 2.50 fr.; younger classes 1 to 1.75 fr., and women 1 to 1.25 fr. In the Loire Basin the new agreement provides for increases ranging from 2.50 to 1 fr. according to the character of work. In the other basins agreements have been arrived at or are

being discussed. Although the new agreements provide for wage increases it is said they are not satisfactory to all workers. Advances in the prices of coals is now looked for.

Inquiry for industrial and house coals is not active. Buying is slow and retail yards contain a large supply of house fuel. Paris dealers are now prepared to meet the Government's requirements for "popular" coals which will sell around 200 fr. per ton, and if sufficient Ruhr lignite briquets can be obtained they will be disposed of at 170 fr. In addition the Nord and Pas-de-Calais collieries will send to the Paris Prefecture a monthly supply of about 5,000 tons of special coals, to be distributed at a very low cost among the poor.

France and Luxembourg received during October the following tonnages of indemnity fuels: 144,200 tons of coal; 195,600 tons of coke and 14,700 tons of lignite briquets. Coke receipts by the S. C. O. F. during October were 132,175 tons. An advance of 8 fr. per ton is expected in the price of manufactured coke as a result of the increase in wages, and as a similar increase is to be made on German coke according to the agreement with the French Government, it is expected that the latter will be quoted at 134 fr. per ton.

Market at Hampton Roads Weak

Business at Hampton Roads was not particularly active last week, the strike on the Virginian Ry. resulting in marked decrease in coal movement, while the Chesapeake & Ohio piers at Newport News showed a decided slump. The Norfolk & Western alone held its own.

Export business dropped to practically nothing, with little new foreign business in sight. Coastwise trade was fair and bunker business was good, the former showing a tendency to increase with the approach of cold weather.

The market weakened in spite of the scarcity of coal at the piers, all grades being quoted far below \$5 which for many months was regarded as the low-

est possible market. Despite curtailed movements over the Virginian Ry. no shortage of coal was anticipated, the demand being much less than supply.

United States October Domestic Coal Exports

(In Gross Tons)

	1922	1923
Anthracite.....	404,999	400,599
Value.....	\$4,532,777	\$4,437,241
Bituminous.....	1,729,425	1,488,867
Value.....	\$10,834,993	\$7,516,221
Coke.....	38,613	77,737
Value.....	\$503,716	\$744,987

TEN MONTHS ENDED OCTOBER

	1922	1923
Anthracite.....	1,543,221	3,846,392
Value.....	\$16,284,882	\$41,736,118
Bituminous.....	7,996,158	16,823,508
Value.....	\$45,986,103	\$92,825,649
Coke, tons.....	294,894	1,010,456
Value.....	\$2,977,064	\$10,978,978

Export Clearances, Week Ended

Nov. 24, 1923

FROM BALTIMORE

	Tons
Br. SS. Lord Ormonde.....	3,027
Ital. SS. Giovanni.....	11,277

For France:

Ja. SS. Chili Maru.....	8,485
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FROM HAMPTON ROADS

	Tons
For Brazil:	
Er. SS. Fernmore, for Rio de Janeiro.	7,362
For Canada:	
Amer. Schr. Katharine May, for St. Georges.....	1,403
For Dominican Republic:	
Amer. Schr. Balsa, for Santo Domingo	649
For West Indies:	
Amer. Schr. William Booth, for St. Stephens.....	797
Amer. Severance, for Fort de France	6,780

FROM PHILADELPHIA

	Tons
For Newfoundland:	
Nor. SS. Skulda, for St. Johns.....	...
Br. Schr. Flowerdew, for St. John's.....	...

Hampton Roads Pier Situation

	Nov. 15	Nov. 22
N. & W. piers, Lamberts Pt.: Cars on hand.....	2,480	1,899
Tons on hand.....	147,506	113,069
Tons dumped for week.....	106,219	119,592
Tonnage waiting.....	9,300	10,000
Virginia Ry. piers, Sewalls Pt.: Cars on hand.....	1,044	1,051
Tons on hand.....	63,550	64,450
Tons dumped for week.....	84,840	26,327
Tonnage waiting.....		
C. & O. piers, Newport News: Cars on hand.....	1,661	1,629
Tons on hand.....	86,615	81,335
Tons dumped for week.....	68,309	90,065
Tonnage waiting.....	5,340	9,510

Pier and Bunker Prices, Gross Tons

PIERS

Nov. 17 Nov. 24†

Pool 9, New York.....	\$4.75@ \$5.00	\$4.75@ \$5.25
Pool 10, New York.....	4.40@ 4.75	4.50@ 5.00
Pool 11, New York.....	4.25@ 4.50	4.40@ 4.75
Pool 9, Philadelphia.....	4.90@ 5.05	4.85@ 5.10
Pool 10, Philadelphia.....	4.00@ 4.65	4.00@ 4.65
Pool 11, Philadelphia.....	3.95@ 4.00	3.95@ 4.00
Pool 1, Hamp. Roads.....	4.75@ 5.00	4.50
Pools 5-6-7 Hamp. Rds.....	4.15@ 4.35	4.15@ 4.35
Pool 2, Hamp. Roads.....	4.20@ 4.50	4.15@ 4.25

BUNKERS

Pool 9, New York.....	5.05@ 5.30	5.05@ 5.55
Pool 10, New York.....	4.70@ 5.05	4.80@ 5.30
Pool 11, New York.....	4.55@ 4.80	4.70@ 5.05
Pool 9, Philadelphia.....	5.10@ 5.45	5.10@ 5.50
Pool 10, Philadelphia.....	4.60@ 4.95	4.65@ 5.00
Pool 11, Philadelphia.....	4.25@ 4.50	4.30@ 4.55
Pool 1, Hamp. Roads.....	4.75@ 5.00	4.50
Pool 2, Hamp. Roads.....	4.20@ 4.50	4.15@ 4.25

Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations, by Cable to Coal Age

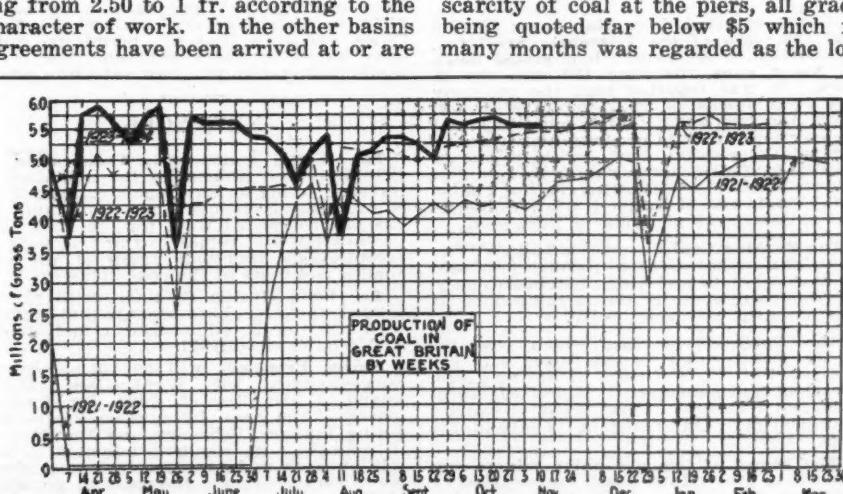
Nov. 17 Nov. 24†

Admiralty, large.....	27s. 6d. @ 28s.	27s. 6d. @ 28s. 6d
Steam smalls.....	17s. @ 18s. 6d.	18s. @ 19s. 6d

Newcastle:

Best steams.....	25s. 6d. @ 26s.	25s. 6d. @ 26s. 6d
Best gas.....	24s.	23s. 6d. @ 24s. 6d
Best bunkers.....	22s. 6d. @ 24s.	24s. 6d

† Advances over previous week shown in heavy type. Declines in *italics*.



News Items From Field and Trade

ALASKA

The government-owned coal mine at Chicaloon, which has been producing a little naval coal of good grade, has been closed down under orders from Washington, the pumps and machinery have been pulled out of it and the mine is now flooded. The Eska government mine, however, is held in readiness to produce coal on short notice.

J. J. Corey, for several years a mining engineer at Coos Bay, Oregon, on the Southern Pacific Ry., has been made assistant to B. D. Stewart, supervising mining engineer for the Bureau of Mines at Juneau.

ILLINOIS

Governor Small has appointed Martin Bolt of Springfield as director of the Department of Mines and Minerals. He will take charge Dec. 1, succeeding Robert M. Medill, who has resigned. Bolt has been assistant director of the department. A. D. Lewis, of Springfield, a brother of John L. Lewis, international president of the U. M. W. of A., becomes assistant director.

Attempts of creditors to force the Smith Lohr Coal Mining Co., of Pana, into bankruptcy have failed. The creditors charged that the company transferred its holdings to the Springside Coal Co. to avert payment of claims held by them. Attorneys for the Smith Lohr company state that the Springside company is a corporation formed to lease for a year property of the Smith Lohr company, a receiver for which had been appointed in the Christian County Circuit Court. This lease they said was approved by the Christian County court and was made in order to keep the Smith Lohr company afloat and not to avoid payment of any claims. The creditors' bankruptcy petition has been denied.

The Clarke Coal & Fuel Co. of Peoria, has discontinued business. For a score of years this company has employed about four hundred miners and its average weekly payroll has been about \$60,000. These miners are now seeking employment at other mines. The mines and all equipment have been purchased by the Case and Moon coal companies, of Peoria, and these operators will handle the Clarke property in the future.

The Coal Valley Mining Co., Matherville, has dismantled its buildings and shipped its machinery to other mines owned by the company. The old shaft has been fenced in and only an ash pile remains to recall the industry which was established 14 years ago. At one time this mine employed about 200 men. The mine has been idle for the last two years.

Although many mines have now closed down entirely or are working only part time, the nine months of 1923 between Jan. 1 and Oct. 1 were record breaking months in the production of coal in Central Illinois. A total of 3,500,000 tons more of coal have been mined in the first nine months of 1923 than were produced during the corresponding period of 1922. From January 1 to Oct. 3 a total of 10,551,569 tons were mined.

No. 4 car of the U. S. Bureau of Mines was stationed at the University of Illinois,



STANDING AT EXTREME LEFT, R. S. CORBIN; NEXT TO RIGHT END, W. W. HUNTER

Urbana, two weeks this year, during which time the seniors in mining engineering were given short but intense courses in first-aid and mine-rescue work. A. J. Hoskin, acting head of the department, hopes to have the courses repeated annually, as the students showed deep interest in the work. They received their certificates from the Bureau and also have taken examinations and passed in competency under the Illinois regulations.

William Hutton, of Du Quoin, who for several years has held various positions with the Illinois Mine Workers union, has resigned and will hereafter be connected with the Illinois Coal Operators Association as a field man with headquarters in Springfield.

During the month of October and in spite of the poor marketing conditions, the Southern Gem Coal Corporation broke its total hoisting record at mines Nos. 1, 5 and 6. The latter two mines are in Perry County while the former is located near West Frankfort, in Franklin County.

A. J. Hoskin, acting head of the mining engineering department, University of Illinois, Urbana, was recently in the Jellico field of eastern Tennessee inspecting mines in the Swamp Angel, Blue Gem and Jellico seams.

INDIANA

The United States Steel Corporation has made arrangements at Universal, where it owns two coal mines, to install fire protection for the mining town. A complete fire department will be installed, pipes being laid throughout the village, hose purchased, apparatus furnished and placed in a building especially built to house the department.

Fire caused a loss of \$25,000 or more in the tipple building and hoisting apparatus at the Interurban Coal Co. property, known as the Struggling Monkey mine, northeast of Clinton Monday, Nov. 19. About 150 men will be thrown out of employment. The mine was formerly operated by C. W. Whitlock, of Terre Haute. The origin of the fire was not determined.

Drilling for coal has been begun at Weldon by L. M. Butts and L. G. Jamison, on land belonging to the former. Indications are that coal will be found at a depth of 200 to 250 feet.

The Pershing mines near Knoxville, have been busy recently. The tonnage for two weeks in October averaged 1,650 tons per day from No. 12 mine. Officials state that this has been the best year, with the largest output of coal, since the mine began operating. During 1923, up to October, the Pershing mines produced 260,000 tons of coal.

KENTUCKY

It was reported from Harlan on Nov. 8 that the plant of the Wisconsin Steel Co., at Benham, near Lynch, had closed down its No. 2 mine, throwing 400 men out of work. It was reported that the company has good stocks of coal in its steel-mill yards and had found that it could buy coal cheaper than it could produce, and from the Central Competitive Field, with a shorter freight haul and lower rate. It was also reported that the Wilson-Berger No. 2 mine had closed, and that the Harlan Collieries Co., at Ages, was planning to close soon.

The Barking Coal Co., of Kimball, W. Va., is making preparations to develop new coal lands located near Dalna, Letcher County. The company operates the Barking mine at this place, on the L. & N. Ry.

The Porter-Givan Co., which was recently incorporated in Aberdeen, has organized with C. H. Givan, of Spring Lake, president and manager, C. V. Porter, secretary and treasurer. Coal lands are under development. Daily output is about 225 tons.

The homes of two non-union miners employed by the Hart Coal Corporation, a company which has been running "open

shop" since July 1, were fired upon, and bundles of switches along with threatening notes were left on the doorsills early in November. The county attorney's office has been investigating the cases. There has been no follow-up to the threats.

MARYLAND

Announcement has been made that the strike in progress for the last eighteen months in District 16, embracing the Upper Potomac field and the Georges Creek region, has been called off by the International organization of the United Mine Workers. Operators in these fields declined to become parties to the agreement which terminated the last nation-wide strike and announced that they would operate their mines open-shop. Although a few of the smaller companies signed an agreement most of the mine owners refused to do so and have been successful in mining coal without an agreement with the union. A number of the miners originally on strike returned to work. Calling off of the strike is construed to mean that such miners in the district as have refused to work will no longer be aided by the union and that the union organization will have to be abandoned. If that is the case it means that two districts have been wiped out as a result of the 1922 strike—districts 16 and 29—the latter having embraced the New River field.

MASSACHUSETTS

Representative Treadway of Massachusetts has sent an open letter to Governor Pinchot of Pennsylvania calling on the Governor to answer five questions relating to the coal situation. They are: "Will you call a special session and recommend the repeal of the state tax in order to reduce the cost of anthracite to the consuming public by about \$8,000,000? Will you allow this tax to continue in effect until the regular session of the legislature in 1925? Will you use your great influence to reduce the royalties now extortiously laid on the consuming public by the land owners in your state? Will you set these examples to the operators and then repeat your request to them to refuse their profits? Will you arise to the opportunity or will you continue to act the part of a demagogue?"

Attorney General Daugherty in a letter to Congressman John Jacob Rogers says that proper legal action is being prepared by the Federal Department of Justice regarding certain features of the anthracite industry and will be taken very soon. Mr. Daugherty's letter was in reply to one from Mr. Rogers asking that the department make a searching inquiry to determine whether there was a conspiracy in the Pennsylvania coal fields to mulct the public by price manipulations. Congressman Rogers said that he does not think much congressional legislation regarding anthracite was necessary, as there was "law enough now on the statute books to pull down the price of anthracite to the consumer."

MINNESOTA

Civic bodies of St. Paul and Minneapolis have filed statements in Washington, protesting against the proposed 11c. decrease recommended on coal freights from the docks to the Twin Cities. This would cut the rate for soft coal from \$1.82 to \$1.71. They contend that any rate in excess of \$1.50 is discriminatory against the Twin Cities, and state that if a permissive order were issued by the commission, the roads would voluntarily put that rate into effect.

NEW YORK

The Walter Engineering Corporation, of 299 Broadway, announces the affiliation of David L. Wing as an associate. Mr. Wing is an expert economist and accountant. He has just completed work for the U. S. Coal Commission and comes to the firm with an exceptionally thorough grasp of the economics and facts of the coal industry.

The Pennsylvania Fuel Co., with \$20,000 capital stock, has been organized at Buffalo, with Clayton Ewell, president and George J. Mechau, vice-president.

Sealed Proposals will be opened by the Superintendent of Lighthouses, Staten Island, 2 p.m., Dec. 3, 1923, for approximately 1,800 tons bituminous steam coal during January, February, and March, 1924, in quantities as required trimmed in vessels bunkers under contractor's coal chute, New York Harbor. Information on application.

Governor Smith at the request of the mayors of the respective cities, has appointed the following fair-price coal commissioners to act with two commissioners appointed by the mayors, one to represent the consumers and the other the dealers: For Corning, Aaron F. Williams; for Yonkers, Dr Elmer A. Sheets. With the exception of Schenectady, no other cities have made requests for the appointment of such commissioners. As soon as Mayor Whitmyre of Schenectady names the two commissioners for that city, Governor Smith will name a commissioner to represent the state and act with them. Some of the cities from which the governor has heard have said they have no need for such a commission.

The Fair Price Coal Commission of New York City on Nov. 20 announced its schedule of what it regards as fair prices for anthracite in the five Boroughs as follows: Manhattan, \$14.25 a ton; Brooklyn, \$14.50 to \$15 dependent on the distance from tide water; The Bronx, \$14.25 to \$15; in Queens, \$14.50 to \$15.75; and in Richmond, \$15.50. In setting this price scale, after an extensive investigation by Health Department inspectors, the committee pointed out that the price of coal to the retailers is \$9 for the long ton, the freight costs averaging about \$2.79 and the cost of local handling about \$2.08. The coal is sold by the short ton, and this, with 75c added to allow for deterioration, would bring the price per short ton, as delivered to the consumer, to \$13.22. The margin allowed is held to be the legitimate profit of the retailer.

No action was taken by the directors of the Elk Horn Coal Corporation at their meeting last week on the dividend on the preferred stock. The corporation reports for the ten months ended Oct. 31 net earnings of about \$204,000. A preferred dividend of \$99,000 was paid this year, leaving a balance of \$105,000 to be carried to surplus. Output for the first ten months was 992,883 tons, as against 738,627 for the same period last year.

NORTH DAKOTA

The proposed advance of freight rates on lignite from North Dakota into Minnesota has started a general fight. The State Railroad and Warehouse commissions of North and South Dakota have protested against the increase, and have been granted a suspension to permit a hearing. The North Dakota body has also asked the Interstate Commerce Commission for a joint conference on the petition of the railroads for an increase. Lignite operators have entered their objection and declare that the raise would kill the lignite business. They state that 75 per cent of the lignite mines would be closed if the increase is made.

OKLAHOMA

A recent traffic agreement between the Joplin & Pittsburg Ry. Co., and the Northeast Oklahoma Railroad Co., together with the recent completion of physical connection between the two lines, made possible the first transportation of coal directly from the Pittsburg field to the Oklahoma zinc field, Nov. 9. On that day six cars of coal were moved from Crawford County to Columbus, Kan., over the Joplin & Pittsburg and from Columbus to Picher, Okla., over the Northeast Oklahoma.

PENNSYLVANIA

The Bertha-Consumers Co., of Pittsburgh, at a cost of \$500,000, has completed installation of shaker screens, picking tables and loading booms on the tipples of all its mines, together with storage-battery locomotives for gathering purposes. John H. Jones, president of the company, who, accompanied by his son, Marshall J. H. Jones, has just returned from an inspection tour of the properties, is very optimistic concerning future business conditions and looks for continued prosperity during 1924.

The Philadelphia Division of the B. F. Sturtevant Co. will be located after Nov. 19, 1923, at Thorne & Copewood Streets (near White Horse Pike and Haddon Avenue), Camden, N. J., in a modern daylight building, with railroad siding. The new shop will manufacture all kinds of sheet-metal work required for the complete installation of fan systems including heating, ventilating, drying, exhaust, and conveying work. Guards for machines, pulleys, and gears also will be manufactured. Standard equipment such as electric propeller, monogram, and planing mill fans, steel pressure blowers, turbo undergrate blowers, blast gates, etc., will be carried.

The first steps of the Reading Company to comply with the decree of the U. S. District Court in divorcing its coal business from its railroad business was taken last week, when an application for approval of a merger of all the railroad corporations of the company was filed with the Public Service Commission at Harrisburg. The Reading Company, as the holding company, controls the Philadelphia & Reading Railway Co. and twelve other underlying companies. The merged companies will be known as the Reading Company, and the commission will hear the application Dec. 5. The company contemplates forming another holding company for the coal and iron business, independent of the railway company.

Harry B. Henderson, referee for the Workmen's Compensation Board in the Pittsburgh district, has resigned, effective Dec. 1. Dr. Royal Meeker, Secretary of Labor and Industry, has appointed Charles P. Pearson, of Pittsburgh, as the successor to Mr. Henderson.

Leroy Coal & Mining Co., Youngwood, has been incorporated to mine, transport, purchase and sell bituminous coal with a capital of \$20,000; Incorporators are Logan G. Harrold, treasurer; L. W. Blackburn and N. L. Miller, Youngwood.

T. F. Quinn, president of the Quinn Coal Co., has obtained a long-term lease on the Consolidated breaker of the Hillside Coal & Iron Co., below Moosic. He will prepare coal from his own mine in the section at the leased operation. The Consolidated mine has been worked out, officials of the Hillside company announced.

John Carr & Sons, Inc., Irwin, has been incorporated to mine coal and such other minerals as are incidentally developed; capital \$10,000; incorporators, James E. Carr, North Irwin, treasurer; John Carr, North Irwin, and John S. Carr, Irwin.

The Hudson Coal Co. has instituted a school for mine officials. Twenty young men have been employed by the company to study the various phases of mining. The course will cover a period of two and a half years, and the students, most of whom are college graduates, will be given positions of official capacity at the completion of the course.

Louis Hamer will be purchasing agent of the Hazle Brook Coal Co. after Dec. 1. Stores of the firm are located at a number of towns, including Hazle Brook, Maryd, Mid Valley, Park Place, Buck Mountain and Upper Lehigh. Mr. Hamer will succeed Guy Watson, who has resigned after five years' service in the position. Mr. Hamer's office will be located in Hazleton.

The Scranton Coal Co. has placed its West Ridge colliery on the market at a price of \$200,000. The mine has been idle for the past two years due to severe water conditions. It is reported that negotiations for the sale of the operation are now underway.

UTAH

The Pittsburg Boiler & Machinery Co. has purchased the plant of the Salt Lake Iron & Steel Co., at 540 West Seventh South St., Salt Lake City. Announcement of future operations include the building of complete equipment for coal fields and the erection of tipples. The company plans to spend \$500,000 on enlargement of its plant.

The Wyoming-Utah Coal Co., a Scofield corporation, has been adjudged a bankrupt in the U. S. District Court. S. T. Corn, of Salt Lake City, has been appointed referee. The company filed a petition in voluntary bankruptcy.

WEST VIRGINIA

The Fordson Coal Co. has acquired the title in fee to between 5,000 and 6,000 acres of coal land lying west and north of Davy embracing the Twin Branch operation and tracts, leased by the Fordson company several months ago. The purchasing company obtained the property and title from the J. B. B. Coal Co. and William B. Wheeler, John Gilbert and others, as trustees of the Lasher estate, of Philadelphia. After the Fordson company leased the J. B. B. property a short time ago it began to make many improvements, repainting houses, building sidewalks and erecting a club house.

After denying on Nov. 16 the motion of counsel for William Blizzard, placed on trial for participation in the armed march of 1921, for a change of venue, Judge Summers H. Sharp in the Circuit Court of Greenbrier County, on Nov. 20, after making a further investigation granted the mo-

tion of the counsel for Blizzard. Choice of another county in which Blizzard shall be tried was left to attorneys in the case for agreement. When the attorneys were unable to agree on a county to which the Blizzard case should be transferred, Judge Sharp designated Fayette County.

The tax program adopted by the West Virginia Manufacturers Association at its annual meeting at Huntington calls for the imposition of a service tax of 1 per cent on the sale value at the mouth of the mine of all coal produced in the state, the proceeds of the tax to be used for the maintenance of the state constabulary, miners' hospitals and the mine inspection bureau.

F. A. Scott, of Fairmont, has completed arrangements to purchase the mine of the Stone Lick Coal Co., located about two miles from Weston. The new owner plans, it is understood, to install all new mine equipment and expects to mine coal on an extensive scale.

The Big Vein Anthracite Collieries, Inc., has closed negotiations for the purchase of the mining operations of the Superior Anthracite Corporation on Brush Mountain, at McCoy, the consideration being \$225,000. The deal becomes effective at once.

A large tract of high-grade coal in Webster County, in the Eagle and Sewell New River series is being developed by the Holly Elk Coal Co., organized by Clarksburg business men and capitalized at \$350,000. A. C. McIntyre is president; George W. Lynch treasurer and Walter M. Elliott secretary. Levi Keister is superintendent in charge of development work. Progress is being made in getting the mine ready for operation. The coal will be shipped over the Baltimore & Ohio, as a line from Centralia is now being graded and will be extended four miles up Elk River.

B. A. Lindeman, of Chicago, having resigned as president of the Fairmont Mining Machinery Co., O. A. Seyforth, of Fairmont, has been chosen to succeed him. C. R. Burt, of Toledo, has been elected vice president and director of the company.

R. T. Hubbard, of Fayetteville, has been appointed by the Circuit Court of Fayette County as receiver for the Gaymont Coal Co. and the U. S. Pocahontas Coal Corporation, which operates the old Gaymont mine near Hawk's Nest on New River. The court has also enjoined W. A. Ohley and others from selling the property under distress warrants or executions. The property has been under the direct management of W. A. Cravner. The president of the Gaymont Company is Jean F. Smith, of Huntington, who also is a creditor to the extent of \$50,000. Other liabilities are said to aggregate to \$75,000. The Gaymont mine ranks as one of the oldest on New River. There is a leasehold of 1,345 acres involved, on which a royalty of 10c. per ton is paid. Not more than 300 acres have been so far mined.

With a view to furnishing more power to the mines in the territory reached by it the Appalachian Power Co. is installing its third 20,000-kw. turbine as well as additional boilers at its Glen Lyn steam plant. When the improvements are completed the plant will have a capacity of 58,750 kw., or nearly 80,000 hp., which added to the hydroelectric development of the company of 28,000 kw., or nearly 40,000 hp., will give the company a total plant capacity of approximately 130,000 hp. Four boilers are being installed.

With the completion of its new plant and tipple at Concho, the Rock Lick Smokeless Coal Co. has begun the production and shipment of coal. The new steel tipple built by the Kanawha Manufacturing Co., has a daily capacity of more than 2,000 tons. It is so equipped that lump, slack, egg, three quarter lump and mine-run may be loaded. The tipple also is equipped with the necessary safeguards for the men working on and about it. C. H. Mead, one of the leading coal men of southern West Virginia, is president and general manager of the Rock Lick company.

WASHINGTON, D. C.

George H. Cushing is completing a two-weeks' speech-making tour of the Northwest, under the auspices of the National Coal Association.

F. R. Wadleigh, former chief of the fuel division of the Department of Commerce, has been appointed consulting engineer in the Bureau of Mines, effective Nov. 16. It is also stated, says a newspaper dispatch on reliable authority, that Mr. Wadleigh will receive a similar appointment in the Department of Commerce.

CANADA

Production of soft coal in eastern Canada during the first ten months of 1923 amounted to 4,363,737 tons, as compared with 4,259,366 tons for the twelve months of 1922, according to a statement attributed to the British Empire Steel Corporation. Premier Armstrong of Nova Scotia estimates that the production of coal in eastern Canada for the year will amount to more than 6,000,000 tons.

H. J. McCann, assistant general manager of the Dominion Coal Co., has been appointed general manager. A. S. MacNeil has been appointed general superintendent of all the mines of the British Empire Steel Corporation, and Walter Herd chief mining engineer.

Charles Stewart, Minister of the Interior in the Dominion Government, recently proposed to the Government of the Province of Alberta that the province take over the supervision of fuel conservation work in conjunction with the regular inspection of mines to avoid the present overlapping between the two governments.

Those associated with the coal-mining industry in British Columbia have been interested in the recent reports of the efforts being made by Wm. Sloan, Minister of Mines, to induce the provincial government to place a sales tax on fuel oil used in British Columbia. Indications are the government will give the legislative assembly a chance to pass upon a small sales tax on all imported oil.

The Dominion Coal Co. has shipped its first coal cargo of the present season amounting to 8,500 tons to Holland, and it is expected that many other consignments will follow. Last year the company sent 125,000 tons to Rotterdam and negotiations for obtaining an increased contract are in progress.

The Newfoundland Coal Mining Corporation is being formed by Canadian and American capitalists to take over and operate the property of the St. George's Coal Fields, Ltd., says a newspaper dispatch. This property is located near St. Johns, and is said to contain much high-grade coal. The new corporation will have \$5,000,000 capital.

Lieutenant-Colonel Charles Villiers has been appointed general manager of the Canadian Collieries (D) Ltd., to succeed the late J. M. Savage. Thomas Graham, who has been performing the duties of general manager temporarily, will continue with the company as general superintendent in charge of operations. Colonel Villiers formerly was assistant manager of the Johnnesburg Consolidated Investment Co. He was for a time general manager of the African and European Investment Co., which controls several coal mines of the Transvaal. He also was with the Transvaal Chamber of Mines.

The "Coal Mines Regulation Act" of British Columbia is to be amended at the session of the Provincial Legislature now in progress to provide that all cases of ignition of gas or dust underground, all cases of fire underground, all cases of breakage of ropes, chains, or other gear by which men are lowered or raised, all cases of overwinding cages, all cases of influx of water from old workings and any other dangerous occurrence shall be reported to the Inspector of Mines. At present this is not obligatory unless someone is injured, fatally or otherwise, as a result. Penalties also are to be substantially stiffened.

These officers of the Canadian Institute of Mining & Metallurgy (Vancouver Island Division) were elected in annual meeting at Nanaimo, Oct. 31: Chairman, Charles Graham, general superintendent, Canadian Collieries (D) Ltd.; vice-chairman, Charles Campbell, general superintendent, Granby Coal & Coke Co.; secretary-treasurer, Wm. H. Moore, Western Fuel Co., of Canada; Executive Committee, George O'Brien, Cumberland; Robt. Henderson, Nanaimo; Charles Touhey, Cassidy, and T. A. Spriston, Ladysmith. An address was given by Hugh F. Marriott, of London England; who was passing through the province in the course of a tour of the Empire. He explained that he was working on the organization of an Empire Federation of Mining Engineers, that he had visited South Africa, Australia and New Zealand with success and that he wanted general co-operation in making the Empire Exposition of next year in London an outstanding event in point of its mineral exhibits to the end that it might lead to a closer union and a better understanding in the mining engineering profession throughout the Empire with respect to the development of mineral resources.

Trade Literature

"The Kites Tail," a new publication issued for the automotive department of Colonial Supply Co., 217 Water St., Pittsburgh, Pa. The booklet contains a fusely illustrated descriptions of transmission equipment designed to stabilize this portion of plant operation and reduce production cost.

Storage-Battery Locomotives. Mancha Storage Battery Locomotive Co., St. Louis, Mo. Pp. 19; 9x10 in.; illustrated. This book contains some very useful data on the different phases of haulage and should prove especially attractive to mine superintendents. In describing the Transfer Rack on the last page mention is made that by furnishing an additional battery and box the capacity of a locomotive is increased 100 per cent.; the transfer is made in three minutes.

William Ganschow, president of the Williams Ganschow Co., Chicago, Ill., is editing a new handbook on gears and speed transformers which will be combined with the forthcoming Ganschow General Catalog No. 100. It will be sent upon request.

Traffic News

A phenomenal increase in coal loadings from the Logan, eastern Kentucky and other fields along the line of the Chesapeake & Ohio has made the creation of a new division of the Chesapeake & Ohio with headquarters at Russell necessary. The new division has been created primarily to facilitate the movement and handling of coal freight through the yards at Russell, Ky. W. S. Butler, heretofore first assistant to the general superintendent, E. L. Bock, has been appointed superintendent of the new division. As showing the heavy volume of traffic moved over the Chesapeake & Ohio westward, the daily average forwarding of loads west from Russell in October was 1,808, establishing a new record. In September a record had been established with daily average movement west of 1,798 cars. The management of the road has announced that on Oct. 13 a single shift operating on Pier No. 9 from 7 a.m. to 3 p.m. dumped 228 cars of coal or a total of 10,472 tons, as against a previous record of 205 cars on June 11, 1923.

Questions involved in the matter of Western coal rates will be considered at an Interstate Commerce Commission hearing in Salt Lake City Jan. 10. The case of the Cameron Coal Co. vs. the Santa Fe will be considered at the same time. Examiner Pattison will preside.

The Car Service Division of the American Railway Association says that on Nov. 1 freight cars in need of repair totaled 150,624, or 6.6 per cent of the total number owned. This was a decrease of 5,013 under the number in need of repair on Oct. 15, at which time there were 155,637, or 6.9 per cent.

During the month of October there passed through the Canals at Sault Ste. Marie, Michigan and Ontario, according to the report of L. C. Sabin, superintendent, 2,031,084 net tons of soft coal and 200,600 net tons of hard coal. Of this tonnage all but 31,363 tons of soft coal passed through the United States Canal.

The Interstate Commerce Commission has set for hearing Dec. 13 at 10 a.m., at Kansas City, the complaint brought by the Western Petroleum Refiners' Association against the Missouri Pacific R.R. for lower rates on fuel oil in competition with coal. The hearing will be before Examiner Shanafelt. It was previously assigned for Oct. 31, but postponed on application of complainant.

The Superior Coal Co., of Wheeling, W. Va., has filed a complaint against rates on coal from Chandler, Ohio, to Akron, Ohio.

The American Railway Association announces the removal of offices of the car service division and Bureau of Railway Economics to the Transportation Building, Seventeenth and H Streets, N.W., Washington, D. C. Effective Nov. 15, 1923.

Complaints have been filed with the I. C. C. attacking coal rates from Ziegler, Ill., to Lake Preston and Miller, S. D.

The freight rate on coal from Russellton, Pa., to Youngstown, Ohio, has been found not to be unreasonable. The rate was attacked by the Republic Iron & Steel Co.

Freight rates on lump coal in carloads from mines in western Kentucky on the Illinois Central and the Louisville & Nashville to Marianna, Ark., are not unreasonable, the Interstate Commerce Commission has ruled in a case brought by certain consumers of coal in Marianna.

Class 1 railroads, which operate 90 per cent of the country's rail mileage, earned \$92,238,400 during September, according to estimates prepared from Interstate Commerce Commission reports by the Bureau of Railway Economics. This total was said to represent an annual return rate of 4.46 per cent on the tentative value of property owned by the roads. It compared with earnings of \$58,677,600 made in September of last year and \$98,343,200 earned last August. For the first nine months of 1923, the bureau said, railroads earned a total of \$718,948,600, which represented an annual return rate of 5.27 per cent on the tentative value of railroad property and compared with \$529,470,680 during the same period of 1922.

A new high record in the amount of freight carried was made by the railroads of the United States during the first nine months this year, say reports by the Bureau of Railway Economics. The freight traffic for that period amounted to 343,796,799,000 net ton miles. This was an increase of 2.79 per cent over the corresponding period in 1920, when the previous record, which amounted to 334,457,000 net ton miles, was made. Compared with the first nine months of 1918, when freight traffic was greatly stimulated by the war, the total from Jan. 1 to Oct. 1 this year was an increase of 4.86 per cent. For the month of September this year alone the freight business of the railroads of this country totaled 39,449,128,000 net ton miles, which was the greatest traffic for any September in history except in September, 1920, which exceeded it by about 3% per cent, and September, 1918, which was greater by about one-third of 1 per cent.

Fewer locomotives were in need of repair on Nov. 1 than there have been in years, according to a report by the American Railway Association. On that date the number in need of repair totaled 10,112, or 15.8 per cent of the number owned. This was a reduction of 397 below the number in need of repair on Oct. 15, at which time there were 10,509, or 16.4 per cent. The railroads on Nov. 1 had 54,080 serviceable locomotives, an increase of 489 since the middle of the previous month, while the number of serviceable locomotives in storage and ready to meet increased traffic demands numbered 2,517, or 30 more than on Oct. 15. During the last half of October, 21,989 locomotives were repaired and turned out of the shops, an increase of 2,666 over the first half of the month.

Authority to acquire and operate a branch line in Gibson and Pike Counties, Ind., to develop a coal property, has been asked by the Evansville, Indianapolis & Terre Haute Ry. Co. In its application to the Interstate Commerce Commission, the company points out that this facility is intended for use in the development of an extensive field of commercially valuable strip-mine coal acreage, comprising from 20,000 to 30,000 acres with an estimated yield of 8,000 tons per acre of high-grade bituminous coal or an aggregate of from 160,000,000 to 240,000,000 tons. The acquisition is approved by the Governor of Indiana and by the Public Service Commission of that state."

Substantial reductions in the rates on coal from producing points in Illinois and Indiana to Mason City, Iowa, have been requested by consumers in that city, who use 600,000 tons of this fuel annually. An example of the reductions requested is the rate from Christopher, Ill. The present rate on lump coal is \$3.47. The Mason City consumers attempt to show that the rate should not exceed \$2.90. On fine coal the existing rate is \$3.29. The rate requested is \$2.65.

Coming Meetings

Second National Exposition of Power & Mechanical Engineering. Grand Central Palace, New York City, Dec. 3-8. Managers, C. F. Roth and F. W. Payne, Grand Central Palace, New York City.

Coal Mining Institute of America will hold its annual meeting Dec. 19, 20 and 21 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Chamber of Commerce Building, Pittsburgh, Pa.

West Virginia Coal Mining Institute. Annual meeting Dec. 4 and 5, 1923, Huntington, West Va. Secretary, R. E. Sherwood, Charleston, West Va.